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ABSTRACT

This student activity book and reference book, which are part of a family and consumer sciences education series focusing on a broad range of employment opportunities, are intended for use in 1- and 2-year textile and apparel production, management, and services programs for Texas high school students. The reference book provides information needed by employees in this occupational area. Each chapter includes the following components: (1) a list of the Texas Essential Knowledge and Skills that are discussed in the chapter; (2) a list of chapter vocabulary; (3) italicized, bold-faced vocabulary terms with definitions or explanations; (4) illustrations of equipment and procedures used in the industry today; (5) boxes posing "essential questions" about the materials presented; and (6) chapter highlights. Concluding the reference book are a 28-item reference list and an index. The student activity book provides a variety of pencil-and-paper activities designed to correlate with and reinforce the concepts presented in the reference book's 23 chapters. The following are among the topics covered in the program: the textile and apparel industries; career opportunities and employability success; selecting and coordinating

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apparel and accessories; design; merchandising; sewing equipment; garment design, construction, and alteration; laundry and dry cleaning; and safety and sanitation. (MN)

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PRODUCTION, MANAGEMENT, AND SERVICES

STUDENT ACTIVITY BOOK

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FAMILY AND CONSUMER SCIENCES EDUCATION • TEXAS EDUCATION AGENCY • AUSTIN, TEXAS

Textile and Apparel Production, Management, and Services

Reference Book

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Chapter 1

The Textile and Apparel Industries

Chapter Focus

The following Essential Knowledge and Skills are discussed in this chapter:

3C Analyze the impact of technology on production of fibers, yarns, and fabrics.
4D Describe the impact of production and quality control systems on the worker, product costs, and quality.
5C Determine uses of technology in apparel design and production.
7I Analyze the impact of technology and societal patterns on commercial textile and apparel care operations.
12B Analyze the future employment outlook in the textile and apparel industries.
12H Describe the size, scope, and importance of the textile and apparel industries.
12I Describe the impact of international trade practice on the textile and apparel industries and on U.S. economics.
13C Analyze legal aspects of the textile and apparel industries.

Chapter Vocabulary

Agreement on Textiles and Clothing (ATC)
apparel
apparel industry
Care Labeling Regulation
Code of Federal Regulations (CFR)
computer-aided design (CAD)
computer-aided manufacturing (CAM)
computer integrated manufacturing (CIM)
Consumer Product Safety Act
exports
Federal Trade Commission (FTC)
Flammable Fabrics Act of 1953
Fur Products Labeling Act
imports
Multifiber Arrangement (MFA)
Quick Response (QR)
sewn products industry
softgoods chain
softgoods industry
sweat shops
technology
Textile Fiber Products Identification Act
textile industry
textiles
trade deficit
World Trade Organization (WTO)

Textiles and apparel are basic to human life. Clothing is the most obvious product of the textile and apparel industries. There are many other uses for textiles.

The textile and apparel industries contribute to the economic health of the United States. In 1999, over 1.4 million people were employed by the textile and apparel industries. In the same year, more than 5,000 textile companies and approximately 20,000 apparel firms existed in the United States. Forty-five states had textile plants, forty-eight states had apparel manufacturing plants, and fifty states produced natural or manufactured fiber. Heavy concentrations of these industries can be found in all parts of the United States. Furthermore, approximately 200 nations produce for the international textile and apparel market today.

The word ***textiles*** is used to describe materials such as fibers, yarns, fabrics, or products made of fibers, yarns, or fabrics. Except for certain knitwear, use of the term in this manner usually does not include apparel. ***Apparel*** is the word used to describe items of clothing produced from various textile products. Using these definitions, it is apparent that the textile and apparel industries employ people in a variety of jobs and produce many types of products.

The use of the term ***textile industry*** more commonly refers to the fiber-to-fabric segment of the industry. More specifically, it involves the operations of carding, combing, spinning, weaving, knitting, and finishing.

Reference to the ***apparel industry*** applies only to the industry segment involved in the manufacture of garments and certain accessories. In particular, the operations include product development, cutting, sewing, contracting, and marketing.

The ***sewn products industry*** includes all stages of apparel production. In addition, it includes a number of other sewn product categories such as interior furnishings (like draperies and linens), luggage, awnings, and sewn toys.

The term ***softgoods chain*** and ***softgoods industry*** are the most comprehensive. Each of these terms includes the manufacturing of textile or apparel products from the fiber stage through completion of end-use products. The terms may also include the retailing or other distribution phases associated with making the products available to the consumer (including direct mail, e-commerce, and television).

Textile products are used in various ways in our society besides in the production of apparel. For example, tires are made from textile products. Currency is made from textile products. Textiles are used in the production of such consumer products as tea bags, home furnishings, and food packages. Many textile products are used in fields of high technology such as medicine. Artificial arteries, used by surgeons to prevent blood clots and rejection of transplanted hearts, are made of knitted polyester. The Department of Defense uses approximately 10,000 items that are made entirely or partially from textiles. Some jet airplane bodies are made of carbon fibers. From these examples, it is apparent that textiles play an important role in society.

OVERVIEW OF THE TEXTILE AND APPAREL INDUSTRIES

The textile industry has been important to the growth of the United States since colonial days. In the late 1700s, cotton was produced in the South and was primarily exported to England. Samuel Slater, an English mechanic, immigrated to America and built a spinning mill in Rhode Island based on plans he had memorized while working with textile mills in England. The textile industry, initially based in New England, expanded to the South during the 1800s to be closer to the production of cotton and sheep.

A variety of other inventions, such as Eli Whitney's cotton gin, helped the textile industry develop into a major part of life in the United States. In 1813, Francis Lowell introduced the power loom, which allowed weaving to be done more efficiently in textile mills by larger numbers of people. The sewing machine, an invention of Walter Hunt, was significantly improved by Elias Howe in 1845. In 1846, Isaac Singer began mass producing a sewing machine that used a foot treadle. An electrically-powered sewing machine was introduced in 1921. In 1884, the first manufactured fiber, rayon, was produced. Nylon, another manufactured fiber, was produced in the 1930s, followed by polyester, acrylic, and other fibers.

The fashion industry in the United States began in the area around New York City. During the 1890s, large numbers of immigrants arrived in New York City from various countries. Many of the immigrants were hard workers and skilled laborers in jobs relating to the fashion industry. They were willing to accept employment for low wages and were often employed under poor working conditions. Small factories developed and were known as ***sweat shops*** because of their unhealthy and sometimes unsafe working environment. As unions were formed and workers began striking, laws were passed to protect workers. Most owners of sweatshops were forced to improve working conditions. With its status as a major port and as the center of major fashion news, New York City continues to be the largest marketplace for fashion in the United States.

Retail began in the United States with general mercantile stores that provided many different types of merchandise to customers. The industrial revolution allowed more products to be produced, which encouraged increased selling to customers. The industrial revolution also employed workers in jobs that allowed them to make more money. As a result, a middle class developed in the United States. Department stores opened in cities where large numbers of people moved to gain employment. A new philosophy of serving the customer developed. Apparel was a major merchandise category sold in these department stores. As the history of retail evolved, other types of stores developed. Specialty stores, chain stores, and discount stores are examples of retail organizations that have influenced the apparel industry.

◆ *Essential Questions:* ◆ *Overview of the Textile and Apparel Industries*

1. How do the terms textile industry and apparel industry differ?
2. What are examples of the variety of products that are manufactured from textiles?
3. How has the textile industry grown in the United States since colonial days? (Briefly summarize key developments.)
4. How did New York City become the center of the fashion industry in the United States?

THE IMPACT OF INTERNATIONAL TRADE

By the late 1800s, Japanese cotton mills began exporting cotton fabrics to the United States. ***Imports*** are goods that are purchased from other countries. ***Exports*** are goods that are sold to other countries.

During the depression, the Japanese cotton imports caused serious economic problems for the United States by adding to the unemployment problem experienced by Americans. President Franklin Roosevelt appointed a Cabinet-level committee to recommend solutions to the unique problems of the American textile industry. The first quotas on Japanese textiles and apparel were enforced by the United States in 1937 in an attempt to keep imports in balance with exports to other countries. When the value of goods imported into a country is more than the value of goods exported from a country, a ***trade deficit*** is created. Trade deficits have serious negative economic results.

Presidents Franklin Roosevelt, Dwight Eisenhower, John Kennedy, Richard Nixon, Jimmy Carter, Ronald Reagan, and Bill Clinton all had important roles in developing agreements with foreign countries regarding exports of textile goods to the United States. Rules for textile and apparel trade, initially signed by 50 countries, were stated in the Arrangement Regarding International Trade in Textiles, commonly known as the ***Multifiber Arrangement (MFA)***. This agreement became effective in January 1974 and was renewed consistently through December 1994.

The ***Agreement on Textiles and Clothing (ATC)*** replaced the MFA on January 1, 1995 as the instrument to provide the guidelines to integrate textiles and apparel into mainstream international trade rules. Consequently, within a ten-year period, rules for textile and apparel trade will not be separate from the ***World Trade Organization (WTO)***. The WTO is the comprehensive and powerful body established in 1995 to handle and monitor world trade.

Employees in many developing countries in the world earn much lower wages than employees in the United States. These countries with lower wage scales are able to produce textile and apparel products at lower costs than the same items can be produced in the United States. As a result, there has been a great increase in the number of textile and apparel products being imported into the United States in recent years. In many cases, consumers are able to buy imported textile and apparel goods at lower prices than they can buy goods made in the United States. Representatives of the textile and apparel industries feel that the import problem is a major threat to the industries in the United States. Legislators and industry representatives continue to search for solutions to the problem. These industries attempt to promote U.S. textile and apparel products to American consumers.

The interconnectedness of people and nations characterizes the modern world, and increased interaction has developed into global interdependence. Consequently, today, the textile and apparel industries no longer operate in isolation. Together, textile and apparel production is the largest source of industrial employment in the world, and approximately 200 nations produce for the international textile and apparel markets. Today, the U.S. textile and apparel industries provide jobs for approximately 1 of every 11 industrial workers. Production facilities are located in every state. Therefore, the U.S. textile and apparel industries must function as part of a global economy. U.S. manufacturers have become partners with competitors in other countries. Industry workers compete for jobs, often without knowing it, with workers from other countries around the world. Additionally, choices have expanded for retailers as an increasing number of textile and apparel producing countries compete for their orders. Many economic, political, and social concerns are involved in resolving issues related to producing textile and apparel products for international markets.

◆ **Essential Questions:** ◆
The Impact of International Trade

1. What factors led to the first quotas on textile and apparel products?
2. What is the purpose of the Agreement on Textiles and Clothing (ATC)?
3. What factors have led to the increase in the number of textile and apparel products being imported into the United States in recent years? Why is this a problem for U.S. industries?

TECHNOLOGY IN THE INDUSTRY

In order to remain competitive and increase efficiency, each year the textile and apparel industries invest in new equipment. Today, many textile mills, manufacturers, and retail operations use high-technology equipment. ***Technology*** involves applying knowledge through the use of inventions or methods to improve a process. High-speed spinners, electronic sensors, shuttleless looms, and high-speed looms are technological developments that have made United States firms more competitive.

Technology can speed production, improve the quality of products, and increase accuracy. ***Computer-aided design (CAD)*** of garments is now used by many companies. CAD makes it possible for preassembly jobs, such as certain parts of the pattern-making process, to be computerized. Traditionally, such jobs have been done manually and required great skill. Most apparel manufacturers now use automated systems to lay out patterns for cutting garment pieces. Some manufacturers have totally automated manufacturing systems called ***computer-aided manufacturing (CAM)***. CAM allows jobs such as the cutting of garment pieces to be computerized.

There are several advantages to using CAD and CAM systems in apparel design and manufacturing. One advantage is that a business can save money on the amount of fabric used because of the efficiency and accuracy of the CAD system. A CAM system requires fewer people and allows employees with less experience and skill to perform tasks that previously required a high level of skill. The speed of the CAD and CAM systems is another advantage. Many businesses have reported a substantial savings in production costs as a result of using CAD and CAM systems. Some businesses have linked CAD and CAM to create CAD/CAM systems that involve both computerized design and automated manufacturing. This is known as ***Computer Integrated Manufacturing (CIM)***.

Computerized information systems are used to run automated order processing, warehouse, and shipping activities known as ***Quick Response (QR)***. One example involves a major fiber company, a fabric company, and an apparel company being linked by computer. The ordering of goods, scheduling of production, and distribution-management systems are all coordinated through use of a computerized system. As a result, the retailer's inventory levels are reduced by 50 percent. The retailer is able to receive merchandise as soon as five days after ordering compared to the previous response time of over thirty days. Retail operations have also increased their efficiency by use of items such as scanning devices and computerized cash registers that capture detailed information at the point of sale on products sold. The QR process has improved customer satisfaction by providing products when the customer wants them.

◆ Essential Questions: ◆
Technology in the Industry

1. What are examples of ways technology has affected the textile and apparel industries?
2. What are advantages of using CAD and CAM systems in apparel design and manufacturing?
3. What is an example of a Quick Response systems application?

IMPACT OF RECENT CHANGES IN THE INDUSTRY

During the 1970s and 1980s, the textile and apparel industries made great efforts to obtain a competitive position in the global marketplace. Some of these changes included the following:

- closing or revitalizing outmoded and inefficient manufacturing plants
- consolidating companies
- investing in new equipment and advanced technologies
- practicing new management techniques
- developing greater sensitivity to consumer needs
- establishing stronger working relationships with retailers and suppliers
- shortening the response time for products
- promoting U.S. made products
- influencing legislation

In the last decade the textile industry has averaged about 2 billion dollars per year in investment to upgrade production. The installation of more technologically sophisticated, less labor-intensive equipment accounts for increased productivity.

Although some apparel firms have updated their equipment with new technologies, many have been slow to invest in large capital expenditures because many firms are too small to have the necessary resources. Additionally, many apparel firms now think of manufacturing in terms of marketing strategies. These strategies might include combinations of both U.S. and foreign production.

In recent years, most retailers have been increasing their purchases of textile and apparel products made in low-wage countries. Today, well over half the apparel sold by U.S. retailers is imported. Consequently, when retailers contract with overseas manufacturers to produce their merchandise, they begin to assume more of the manufacturing responsibilities. Some of the problems encountered by retailers who have bypassed U.S. textile and apparel producers to obtain merchandise include the following:

- poor or unpredictable quality
- a long time between ordering merchandise and receiving goods
- inability to predict delivery schedules
- uncertainties related to trade regulations
- poor service
- lack of recourse for defective merchandise

Cost, price, and competition will largely govern the future of the textile and apparel industries. As one progresses from chemical monomer to polymer to fiber to fabric, the labor involvement becomes more labor intensive. Movement of the industry reflects a movement to locations where labor is the cheapest and most abundant. Chemical process of manufacturing, dyeing, and finishing account for 10 percent of the retail price of garments. Spinning, weaving, designing, and manufacturing of garments account for more than 50 percent of the retail price of garments. Consequently, a 10 percent drop or increase in the cost of chemicals is hardly noticeable in retail prices. However, a 10 percent drop or increase in mechanical or labor cost is highly significant and is reflected in the final retail price of garments.

◆ Essential Questions: ◆ Impact of Recent Changes in the Industry

1. What are examples of changes made by the textile and apparel industries in the 1970s and 1980s to obtain a competitive position in the global marketplace?
2. What problems may be encountered by retailers who bypass U.S. textile and apparel producers to purchase products made in low-wage countries?
3. What factors will largely govern the future of the textile and apparel industries? Why?

LEGAL ASPECTS OF THE TEXTILE AND APPAREL INDUSTRIES

Generally, all laws and regulations that relate to the textile and apparel industries are the responsibility of the ***Federal Trade Commission (FTC)***. It is the responsibility of the FTC to prevent unfair and deceptive trade practices, to protect the ultimate consumer, and to regulate segments of the industry itself.

The Wool Products Labeling Act of 1939 (amended in 1986) was designed to protect consumers, as well as producers, manufacturers, and distributors, from the unrevealed presence of substitutes and mixtures and to inform the consumer of the source of the wool fiber. The term fur fiber can be used for the fiber from any animal other than sheep, lamb, angora goat, cashmere goat, camel, alpaca, llama, and vicuna. The fiber produced from those animals can be referred to as wool. The FTC defines the terms that appear on the labels of wool items as follows:

Wool - new wool or wool fibers reclaimed from knit scraps, broken thread, and noils.

Recycled wool - scraps of new woven or felted fabrics that are shredded back to the fibrous state and used again in the manufacture of woolens.

Virgin wool - wool that has never been processed in any way; thus knit clips and broken yarns cannot be labeled virgin wool.

The ***Fur Products Labeling Act of 1952*** applies to furs, those items of animal origin with the hair/fiber attached. The law requires that the true English language name of the animal be used on labels for wearing apparel and that dyed furs be so labeled. Additionally, the country of origin and the presence of used, damaged, or scrap fur must be identified.

The ***Textile Fiber Products Identification Act*** was passed in 1960 and amended in 1986. The act covers all fibers except those already covered by the Wool Products Labeling Act. The following information, in English, is required on the label of most items, including apparel, outer coverings of furniture and mattresses/box springs, bedding, and toweling.

1. The percentage of each natural or manufactured fiber present must be listed in the order of predominance by weight. If a fiber or fibers represent less than 5 percent of the item, the fiber(s) will be listed as "other."
2. The name of the manufacturer or the company's registered number, such as WPL or RN, must be stated.
3. The generic name, or the name of a family of fibers all having similar chemical composition, must be listed. The first time a trademark appears in the required information, it must appear in immediate conjunction with the generic name of the fiber.
4. The name of the country where the product was processed or manufactured must be stated. The country of origin is identified as the country where the item was assembled. For example, if the most labor-intensive parts of a pair of jeans were

assembled in Jamaica, but the fabric was finished in the U.S., the label would read "Made in USA of components made in Jamaica." For fabrics, country of origin refers specifically to the country where the fabric was finished.

The Federal Trade Commission, because of consumer complaints regarding care instructions, issued the permanent ***Care Labeling Regulation of 1972*** (amended in 1984). Manufacturers or importers of textile wearing apparel and certain piece goods must provide only one care method for a product. This should be accurate and detailed information on a permanent label or tag that contains regular-care information and instructions relative to washing, drying, ironing, bleaching, warnings, and dry cleaning. This label must be permanently attached and legible. The regulation specifies the location of the label by product type. As of July 1, 1997, the Federal Trade Commission permitted manufacturers to use the care symbols developed by the American Society for Testing and Materials, rather than the written care instructions previously required by the Care Labeling Rule, as long as explanatory information was provided to consumers with each garment until December 31, 1998. The new system of symbols will harmonize U.S. care labeling regulations with those of Canada and Mexico.

Laws and regulations dealing with textile products and safety issues generally require that selected textile products meet a predetermined level of performance in terms of flammability. Federal regulations are referred to by the designation ***CFR (Code of Federal Regulations)*** with the identifying numbers indicating the product category into which they fall. Various governmental agencies are responsible for enforcement of these safety standards, including the Consumer Product Safety Commission (CPSC, a subdivision of the FTC) that was established in 1972 under the Consumer Product Safety Act of 1972.

The ***Flammable Fabric Act of 1953*** (amended in 1972) was the first national law dealing with flammable fabrics and was enacted after several apparel-fire-related deaths. The Flammable Fabric Act prohibits the marketing of dangerously flammable material, including all wearing apparel, regardless of fiber content or construction. The act covers imported items or those in interstate commerce. In 1972 the ***Consumer Product Safety Act*** was passed establishing the Consumer Product Safety Commission which was given broad jurisdiction over consumer safety.

◆ Essential Questions: ◆ Legal Aspects of the Textile and Apparel Industries

1. What responsibilities does the FTC have related to the textile and apparel industries?
2. What are six examples of legislation that impact the textile and apparel industries? Briefly describe the purposes of each act.

Chapter Highlights

- The textile and apparel industries produce textile and apparel products that are basic to human life. With more than 1.4 million people employed in 1999, these industries are important to the nation's economy.
- The textile industry has been important to the United States since colonial days. A variety of early inventions such as the cotton gin, the power loom, and the sewing machine and the development of the first manufactured fibers contributed to the growth of the industry.
- New York City is the largest marketplace for fashion in America.
- Retail began in America with general mercantile stores and eventually developed into department stores, specialty stores, discount stores, and other retail forms that have greatly influenced the apparel industry.
- Imports and exports have had much impact on the textile and apparel industries. The Agreement on Textiles and Clothing replaced the Multifiber Arrangement in 1995 as the instrument to provide guidelines to integrate textiles and apparel into mainstream international trade rules. The World Trade Organization is the powerful body established in 1995 to monitor world trade.
- Many developing countries are able to produce apparel more cheaply than the same items can be produced in the United States. The United States has experienced a large increase in imports during the last several years.
- The interconnectedness of people and nations characterizes the modern world. Consequently, the U.S. textile and apparel industries must function as part of a global economy.
- Technology involves applying knowledge through use of inventions or methods to improve a process. Examples of improved technology are Computer-aided Design (CAD), Computer-aided Manufacturing (CAM), Computer Integrated Manufacturing (CIM), and Quick Response (QR).
- During the 1970s and 1980s, the textile and apparel industries made great efforts to obtain a competitive position in the global marketplace. This resulted in a number of changes within the industries.
- Cost, price, and competition will largely govern the future of the textile and apparel industries.

(Continued on page 10)

Chapter Highlights

(Continued from page 9)

- Generally, all laws and regulations that relate to the textile and apparel industries are the responsibility of the Federal Trade Commission (FTC). It is the responsibility of the FTC to prevent unfair and deceptive trade practices, to protect the ultimate consumer, and to regulate segments of the industry itself.

- Legislation that impacts the textile and apparel industries includes the Wool Products Labeling Act, the Fur Products Labeling Act, the Textile Fiber Products Identification Act, the Care Labeling Regulation of 1972, the Flammable Fabrics Act, and the Consumer Product Safety Act.

Chapter 2

Textile & Apparel Career Opportunities

Chapter Focus

The following Essential Knowledge and Skills are discussed in this chapter:

12A Determine preparation requirements for various levels of employment in a variety of careers in the textile and apparel industries.

12C Describe entrepreneurial opportunities in the textile and apparel industries.

Chapter Vocabulary

- apprentice
- branded merchandise
- capitalism
- contractor
- converter
- corporation
- cottage industry
- department store
- design studio
- discount store
- entrepreneur
- entry-level jobs
- fashion
- fashion apparel
- franchise
- franchisee
- franchiser
- free enterprise
- freelance work
- garment district
- general partnership
- gray goods or greige goods
- haute couture or high fashion
- industrial apparel production
- jobber
- knitting mill
- limited partnership
- line or collection
- lot numbers or style numbers
- Market Week
- mass fashion
- merchandising
- networking
- personal apparel production
- piece goods
- print design studio
- print plant
- private label merchandise
- retailing
- satellite operation
- screen printing plant
- season
- sole proprietorship
- specialty store
- staple apparel or basic apparel
- weaving mill

The textile and apparel industries offer many exciting and rewarding career opportunities. Some jobs allow people with high school training to be employed while they gain skills and experience. Other jobs require some special training or several years of education. As with other industries, jobs in the textile and apparel industries are classified in different ways because of the tasks performed by employees. Two companies may give different job titles to people with similar job responsibilities. Some companies may require special training not required by other companies.

Because of these variations in job titles and assigned responsibilities, it is impossible to list and describe all jobs existing in the textile and apparel industries. This chapter includes general information on jobs available in these industries. It is important to recognize that employment situations vary.

When planning a long-term career, it is a good idea to seek a position that allows interaction with people in other departments and other companies. Networking often helps people find the jobs for which they are best suited. ***Networking*** is the process of developing contacts or exchanging information with others in order to further one's career. The sections in this chapter group jobs into categories. Sample job descriptions and types of training required are provided. The job titles listed are only examples of jobs available in the textile and apparel industries. It should also be noted that some jobs may be placed in more than one category. For example, the job title of apparel designer may be considered part of the apparel production and management process or as part of the textiles and clothing design category. An important part of career planning is gaining a knowledge of job alternatives available.

Computer technologies have reshaped the textile and apparel industries in nearly every aspect of the business. These advances have increased the variety and availability of products, shortened production time, and improved design and manufacturing procedures. Additionally, technology has eliminated many time-consuming manual operations in every facet of the industry.

The Internet brings to both industry and consumers many new ways to find products and information. Table 2.1 provides a listing of several Web sites related to the textile and apparel industries.

Web Site	**Description**
www.sdahq.org	The Soap and Detergent Association
www.crstamu.org	The Center for Retailing Studies. Index offers selected sites for the executives and researchers with a special interest in retailing.
www.icsc.org	The International Council of Shopping Centers
www.nrf.com	National Retail Federation
www.bobbin.com	Bobbin Magazine, the business and technology authority of the Sewn Products Industry.
www.sewing.org	The Home Sewing Association
www.atmi.org	The American Textiles Manufacturers Institute
www.fabrics.com	Portal site specifically for Textile Industry
www.modacad.com & www.styleclick.com	Moda cad is an enabler of e-commerce for manufacturers and consumers.
www.fashion-icon.com	Fashion Icon brings you fashion news, gathering information from every single facet of the industry.
www.ifi.org	The International Fabricare Institute, the Association of Professional Dry Cleaners, Wet Cleansers and Launderers.
www.ftc.gov	The Trade Commission in the U.S.; provides information on textiles and apparel labeling.
www.fashiondex.com	The leading source for U.S. textiles and trimming suppliers.
www.cottoninc.com	The site of Cotton Incorporated, the marketing arm for cotton fibers, fabrics, and clothing.
www.textrade.com	The Global Textile Network
www.fgi.org	The Fashion Group International
www.astm.org	American Society for Testing and Materials
www.texi.org	The Textile Institute
www.wto.org	World Trade Organization
www.bea.doc.gov	Bureau of Economic Analysis
www.census.gov	The U.S. Census Bureau
www.doc.gov	The U.S. Department of Commerce
www.americanapparel.org	American Apparel Manufacturers Association
www.fibersource.com	The Fiber Source

Table 2.1

As with any other industry, some jobs in the textile and apparel industries do not require special training. These jobs are called ***entry-level jobs***. Other jobs require advanced training that may be received through a vocational school, a college, or an apprenticeship. An ***apprentice*** is trained by working with another person who is skilled at a particular job. In other situations, an employee may be hired in an entry-level position. After gaining experience and skill, the employee may be promoted to another position in the business.

Some jobs are only available to a person who has an associate degree, which requires completion of two years of college. Other positions require a bachelor's degree, a degree received when four years of college are completed. There are some schools that offer one to three-year programs that train people in specialized fields such as fashion design. In some cases, employers are interested in hiring people who have skills in a specific area and who have a certain amount of work experience in the area. Other positions may require a master's degree or doctor's degree from a university. These two degrees are called graduate degrees and require several years of study after graduation from college with a bachelor's degree. Jobs that require a college education or other extensive specialized training or experience are usually classified as professional level positions.

APPAREL SERVICES

The employment area of apparel services covers those occupations that serve customers in the planning, selection, maintenance, and care of apparel. A wide variety of jobs are included in the area of apparel services. Such jobs may be found in different locations such as dry cleaners, laundry services, alteration and repair shops, and various types of retail firms. In addition, some clothing services jobs, such as fashion/image consultant, may be performed out of a person's home.

Some jobs in apparel services involve learning specialized skills. For example, an alterationist must develop skills in sewing and using sewing equipment in order to perform alteration tasks. An alterationist must also develop the skill of identifying fitting problems. Therefore, experience is usually the best way to develop alteration skills. Working in entry-level positions may be necessary. After experience is gained, an employee may be assigned additional responsibilities and given a different job title.

Employees in the area of apparel services must be well organized, flexible, able to follow instructions, and skilled at specific tasks. In addition, some apparel services jobs such as personal shopper, fashion/image consultant, and wedding consultant require some creativity, awareness of fashion trends, and ability to apply design elements and principles. As with other areas of employment, jobs that involve meeting the public require fashionable grooming and neat appearance.

Table 2.2 includes sample jobs in the area of clothing services, job descriptions, and types of training usually required for the identified jobs.

Apparel Services Occupations

Example Jobs	Job Descriptions	Training Required 1	2	3
Apparel Services Aide	Assists supervisor(s) with assigned tasks.	✓		
Alterationist	Specializes in altering completed garments to improve the fit or to restyle them.		✓	
Custom Sewer	Sews custom-made garments for individuals.		✓	
Custom Sewer's Assistant	Assists Custom Sewer with tasks involved in producing custom-made garments.	✓		
Laundry or Dry Cleaners Manager	Manages a laundry or dry cleaner business and supervises employees.			✓
Sorter	Sorts laundry and/or dry cleaning when received according to required treatment.	✓		
Marker/Checker	Checks and marks clothing items as they are received for proper identification and to indicate special treatment required.	✓		
Presser	Uses various types of steam machines and hand irons to press garments after they are cleaned or laundered.	✓		
Repairer	Makes minor repairs to garments before they are laundered or cleaned.	✓		
Personal Shopper	Assists clients in shopping by selecting alternative wardrobe items based on client needs and wants.		✓	
Fashion/Image Consultant	Provides information and suggestions to clients regarding color choices, makeup, and wardrobe selections.			✓
Wedding Consultant	Provides information to prospective brides and grooms regarding wedding plans and selection of wedding apparel.		✓	
Consultant to laundry product manufacturer	Assists in testing laundry products on different fabrics and finishes in order to recommend uses of laundry products.			✓

1-Entry Level or High School 2-Advanced Training (School or Apprentice) 3-College or Professional Level

Table 2.2

◆ **Essential Questions: Apparel Services** ◆

1. Where may jobs in apparel services be found?
2. What are examples of entry-level jobs in apparel services?
3. What are examples of jobs in apparel services that require advanced training?
4. What are examples of college or professional level occupations in apparel services?

APPAREL PRODUCTION AND MANAGEMENT

There are a variety of career opportunities in the areas of apparel production and management. Garment sample makers, pattern makers, and pattern graders contribute to the basic apparel production process. A variety of jobs exist in the cutting and sewing rooms of an apparel manufacturing business. Typical jobs include hand or machine spreader, marker, cutter, sewing machine operator, and finish presser. Occupations in the shipping department of an apparel manufacturing business include packer and shipper.

Apparel production is the process by which fabric is changed into finished garments for purchase by consumers. Apparel is made either through personal apparel production or industrial apparel production. ***Personal apparel production*** involves the process of custom making garments for specific customers and is done by a dressmaker or tailor. The dressmaker or tailor completes all the steps to make an entire garment. There are fewer people employed as dressmakers and tailors today than in previous years.

Most apparel produced today is made in industrial settings. ***Industrial apparel production*** is accomplished by one of three types of apparel firms - manufacturers, jobbers, or contractors. An ***apparel manufacturer*** is a business that designs, produces, and markets garments with its own brand label. Such apparel products are known as ***branded merchandise*** and have a brand name owned by the company on their labels or hang tags. An apparel manufacturer may conduct all aspects of its operation in one plant or may be organized as a ***satellite operation***. A manufacturer with a satellite operation has a central facility where ***piece goods*** (fabric) and other materials are received, designs are made, patterns and markers are created, piece goods are cut, and finished garments are warehoused (stored) and shipped. The actual sewing of garments may be done at several sites located around the central facility.

A ***jobber*** is a business that usually develops ideas for looks or designs, selects the fabric for the designs, and markets the finished products. Some jobbers operate using only a small office from which they contract with other businesses to carry out all phases of the production process. Other jobbers may have a facility where they make a pattern and sample garment for each design idea. The pattern, sample garment, and manufacturing specifications (instructions) are then provided to a contractor who actually produces the garment. In many cases, the finished garments are returned to the jobber for warehousing, sales, and shipping. Jobbers could not be in business without contractors.

A ***contractor*** is a business that owns or rents a building, sets up apparel production equipment, and employs people to make apparel. Contractors produce apparel for jobbers or for manufacturers who receive more orders than expected and cannot produce large enough quantities of goods in their manufacturing plants. Contractors usually require large minimum orders before contracting with a jobber or manufacturer. In addition, some retailers hire contractors to manufacture private label merchandise for them. ***Private label merchandise*** is merchandise made specifically for a particular retailer; it appears in the store with the store's private label on it. The contractor who produces private label merchandise has the advantage of not needing design and sales departments since the retailer specifies the design of the garments ordered and sells the garments through its retail operations.

Towns and cities in forty-seven states in the United States have clothing manufacturing plants. However, the women's apparel part of the industry is concentrated in New York City. Seventh Avenue (Fashion Avenue), between 17th and 40th streets in New York City, is known as the ***garment district***. The state of New York has the largest number of apparel manufacturers in this country. California has the second largest number of apparel manufacturers, followed by North Carolina with the third largest number. Textile and apparel manufacturers are estimated to employ 7.5 million workers, more than any other manufacturer of non-durable goods in the United States.

The apparel industry includes both small and large manufacturing operations. Apparel plants tend to be smaller in size than other types of manufacturing plants. Many companies manufacture various parts of one garment in several small plants in different locations. Most apparel manufacturing plants employ small numbers of people. For example, as few as twenty sewing machine operators may be hired for one plant. It is estimated that the average apparel manufacturing plant has about forty-eight employees. However, there are a few manufacturing operations that are very large. For example, one apparel manufacturer has a single plant in Kentucky with 4,000 employees. This operation is estimated to produce about 300,000 dozen briefs and T-shirts each week. A major manufacturer of men's slacks has a large factory in Texas that employs approximately 6,000 people.

There are also operations called cottage industries that manufacture apparel. A ***cottage industry*** is a production arrangement in which a manufacturing plant is not used. The company owner contracts with individuals who sew entire garments in their homes. Cottage industries provide additional employment opportunities for dressmakers, tailors, and custom sewers.

All garments produced by a single manufacturer that look exactly alike make up one style. Usually each style is assigned a number that distinguishes it from other styles produced. These numbers are called ***lot numbers*** or ***style numbers***. All of the styles designed and produced for the same selling period or season make up what is called a ***line*** or ***collection***. Because fashion changes frequently, apparel manufacturers must adapt to resulting changes in patterns, sewing operations, and ways to assemble clothing items.

Staple apparel or ***basic apparel*** includes clothing items for which demand is based more on consumer replacement needs than on wants. Example staple items include men's white underwear, uniforms, and white dress shirts. Manufacturing methods remain fairly constant for staple apparel since few changes occur in the styling of such items. Thus, producers of staple or basic apparel usually have fewer problems with changes in sewing operations, production quotas, delivery, and returned merchandise than manufacturers of fashion apparel.

Fashion apparel includes items that experience styling changes from season to season based on the wants and demands of customers. Women's apparel is influenced more by fashion changes than any other category of the apparel industry. However, other categories of apparel, such as childrenswear and menswear, also experience styling changes resulting in fashion merchandise.

Apparel manufacturers sell their goods to retailers who sell to customers. An apparel line is designed and produced for a ***season***, a particular time frame for the production and sales life of a collection of styles. Some manufacturers produce special lines for as many as five seasons including Fall and Back-to-School, Winter, Holiday and Resort, Spring, and Summer. Other manufacturers produce fewer lines of clothing.

A line of clothing appears in retail stores one season prior to the season for which the line is designed. For example, Fall lines are usually available in stores during the late Spring and Summer seasons. Spring lines appear in stores during the Winter season. Apparel manufacturers show their newest collection to retailers during a time period called ***Market Week***. Market Week is a time of special promotion to retailers so that orders may be received months before the merchandise appears in stores. Retailers usually order garments by the dozen and by size. Delivery dates are specified when orders are received.

The personal qualities needed for jobs related to apparel production and management include attention to detail, ability to work quickly and efficiently, ability to follow instructions, and organizational skills. Jobs requiring repetition of a specific process many times a day, such as sewing machine operator, require patience and endurance. Employees involved in clothing production may be required to work in crowded working conditions and must be able to perform assigned tasks even when other workers and machinery are noisy. Some clothing production jobs, such as fashion designer, require a great deal of creativity.

Other apparel production jobs require employees to follow detailed instructions in order to reproduce clothing designs exactly as the designer intended. Some clothing production employees are paid based on the amount of work they produce. For example, sewing machine operators are often paid based on the number of pieces they sew during a specific time period. Such employees must be goal oriented and work quickly in order to produce enough work to earn a reasonable salary.

Table 2.3 provides example jobs in the area of apparel production and management, job descriptions, and training requirements for the identified occupations.

◆ Essential Questions: Apparel Production and Management ◆

1. What are the three types of apparel firms that practice industrial apparel production?
2. What is the difference between branded merchandise and private label merchandise?
3. What are cottage industries?
4. What is the difference in staple or basic apparel and fashion apparel?
5. What are examples of clothing production and management occupations that require various levels of training?

Apparel Production and Management Occupations

Example Jobs	Job Descriptions	Training Required		
		1	2	3
Tailor	Makes alterations (retail stores or dry cleaners) or may sew garments to meet needs of customers by cutting, basting, sewing, fitting, and finishing.		✓	
Dressmaker	Makes women's garments such as dresses, coats, and pants according to customer specifications and measurements.		✓	
Tailor's/Dressmaker's Assistant	Assists Tailor or Dressmaker with tasks as assigned.	✓		
Sample Maker	Makes a sample garment from muslin using a designer's sketch.		✓	
Pattern Maker	Constructs a master pattern from a sample garment using heavy paper or fiberboard.		✓	
Machine Spreader	Uses machines to lay fabric evenly back and forth across a cutting table in a factory.	✓		
Cutter (production, hand)	Cuts various garment pieces from layers of fabric spread on cutting tables in a factory.		✓	
Assembler	Collects and bundles garment pieces and accessories to make a complete garment, identifies the bundles to figure earnings of workers paid by the number of pieces they produce, and delivers the bundles to the next appropriate worker.	✓		
Sewing Machine Operator	Uses sewing machine of a specific type (such as single needle or double needle) to perform a specific task (such as collar stitching or pocket making).	✓		
Fashion Designer	Creates original designs for new types and styles of apparel.			✓

1-Entry Level or High School 2-Advanced Training (School or Apprentice) 3-College or Professional Level

Table 2.3

TEXTILE AND APPAREL DESIGN

The field of textile and apparel design involves jobs that require various levels of training. Typical jobs include cutter, grader, finisher, trimmer, apparel designer, textile designer, researcher, and textile product developer. Jobs at all levels require completion of routine tasks. The apparel or textile designer must conduct research in order to develop ideas for designs. This research may involve routine work such as searching through museums, libraries, costume collections, periodicals, and other sources in order to identify ideas that can be used in designing clothing and other textile products.

Job opportunities in the area of textile and apparel design are usually found in design studios, print design studios, weaving mills, knitting mills, print plants, screen printing plants, and converters. A ***design studio*** is a business where designs are created and illustrated for textiles or clothing by people with creative and artistic abilities. A ***print design studio*** is a studio where designs are created and illustrated for prints that will be applied to fabrics used in clothing and other textile products. A ***weaving mill*** is a plant where raw fiber is processed and woven into fabric. A ***knitting mill*** is a plant where fabric is produced by use of a knitting process that involves interlocking a series of loops of one or more yarns.

A ***print plant*** is a plant where patterns are applied with dyes to textile fabrics by stencils, rollers, wooden blocks, or screens. A ***screen printing plant*** is a plant where designs are printed on fabrics by one of two screen printing methods. The screen printing methods involve blocking a pattern out on a fabric mesh or screen so that when a colored print paste is squeezed through, it will penetrate the unblocked areas. A ***converter*** is a business that buys gray goods and sells them to cutters, wholesalers, retailers, and others. The converter arranges for the finishing of the fabric. ***Gray goods*** or ***greige goods*** are knitted or woven fabrics in an unfinished state (after weaving or knitting and before dyeing or finishing).

The personal qualities needed for all textile and apparel design jobs are similar. Employees must be well organized, flexible, fast working, and have the ability to work under pressure. Creativity and knowledge of design elements and principles, awareness of artistic principles, and attention to detail are also important to textile and apparel design employees.

Table 2.4 provides examples of jobs available in the area of textile and apparel design, job descriptions, and training requirements for the identified occupations.

◆ Essential Questions: Textile and Apparel Design ◆

1. Where are job opportunities in the area of textile and apparel design usually found?
2. What are typical personal qualities and skills needed for all textile and apparel design jobs?
3. What are examples of textile and apparel design occupations that require various levels of training?

Textiles and Apparel Design Occupations

Example Jobs	Job Descriptions	Training Required		
		1	2	3
Sketching Assistant	Sketches precise technical drawings of constructed garments and attaches fabric and trim swatches mainly for designers' records. Also prepares artwork presentations.		✓	
Sketcher (assistant to designer)	Sketches free-hand illustrations of designer's ideas, deals with buyers, and contributes original ideas upon request.		✓	
Sample Maker	Makes a sample garment from muslin using a designer's sketch.		✓	
Embroidery designer	Creates detailed technical drawings of designs for lace and embroidery.			✓
Textile Chemist	Specializes in reasearch and development of new fibers and finishes and improvement of existing fibers and finishes through scientific work in a textile laboratory.			✓
Colorist	Creates various color combinations of existing textile designs.		✓	
Screen Printer	Uses the screen printing process to squeeze colored print paste through fabric mesh or screen onto fabric by hand or using automated machinery.		✓	
Roller Engraver	Engraves designs in copper rollers or cylinders used in the roller printing process to print designs on fabric.		✓	
Weaver	Uses a power or hand loom to interlace two yarns or similar materials so they cross each other at right angles to produce woven fabric.		✓	
Fashion Designer	Creates original designs for new types and styles of clothing.			✓
Textile Designer/ Textile Artist	Creates original artistic designs to be used in production of textile fabrics.			✓

1-Entry Level or High School 2-Advanced Training (School or Apprentice) 3-College or Professional Level

Table 2.4

FASHION MERCHANDISING AND RETAIL MANAGEMENT

A variety of jobs are available to people interested in fashion merchandising and retail management. Jobs in these areas vary from being a fashion model to being employed as a store manager of a retail business. ***Retailing*** is the selling of goods or services to the ultimate consumer. The ultimate consumer is the person who buys goods for personal or household use. In general, retail firms are businesses that obtain over 50 percent of their income from sales to the ultimate consumer. The two primary goals of all retailers are to satisfy the consumer and to make a profit.

There are a variety of different types of retail stores. A ***specialty store*** sells one category or related categories of merchandise to a special market of people. An example of a specialty store is a store that sells only fashion accessories such as costume jewelry, handbags, hosiery, and belts. A ***department store*** is a business that sells a wide range of merchandise lines, including home furnishings, apparel for the family, and household linens and dry goods. Department stores sell a variety of textile and apparel related goods in addition to other categories of merchandise. Discount stores have become more popular during the last few years. A ***discount store*** also sells a wide range of merchandise but emphasizes lower prices in order to attract special groups of customers.

Merchandising may be defined in many different ways. ***Merchandising*** is viewed as all the activities involved in the buying and selling of merchandise and includes finding customers and providing them what they want, when they want it, at prices they can afford, and at prices they are willing to pay. Merchandising mainly includes the steps taken internally by a retail organization to present merchandise to the customer so that a profit will be made. To be successful, the merchandiser should have the right merchandise at the right place at the right time in the right quantity and at the right price. These five conditions are sometimes referred to as the five rights of merchandising. Different stores may be organized in various ways but merchandising is an important and necessary function for all retail firms.

Product development, although traditionally considered part of the apparel manufacturing segment of the industry, is increasingly becoming an integral part of the retail organization. Product development involves the development of the line of merchandise and monitors its production to assure that products meet expectations. The product developer is the individual employed by a manufacturer to develop product lines or by a retailer to create private label merchandise for their exclusive use. The product manager is an executive who functions as the head of the product development team. This team is responsible for planning and development of a particular product, product line, or brand.

Fashion is the prevailing style accepted and used by the majority of a group of people at any given time. Different groups often adopt different fashions, and fashions are often classified according to the group to which they appeal. ***Haute couture***, a French term meaning the finest dressmaking, refers to fashion from a designer who creates a collection of original designs that are then duplicated for individual customers on a made-to-order basis. Such fashions are very expensive a[illegible] are purchased by an elite group of customers. These haute couture fashions are also referred to as high fashion. ***High fashion*** means styles or designs accepted by a limited group of fashion leaders,

people who are the first to accept fashion change. ***Mass fashion*** refers to styles and designs that are widely accepted by most people. Such fashions are produced and sold in large quantities at lower prices than high fashion. The area of employment referred to as the fashion industry includes jobs related to promoting or selling fashion apparel and related fashion merchandise (such as cosmetics).

The skills and experience gained by people employed in merchandising and retailing can be used to gain jobs in other areas of retailing. A clothing salesperson learns personal selling skills that would assist in obtaining employment involving sales of other merchandise such as home furnishings or even automobiles. Merchandising and retailing provide a broad base of experience that can qualify people for employment in many different fields.

Employees involved in fashion buying and merchandising jobs must have maturity, a high energy level, flexibility, ability to make decisions, willingness to take risks, and self-confidence. In addition, buyers and merchandisers must be goal-oriented, self-disciplined, and have excellent grooming and fashion sense. A management employee should have a good memory, good handwriting, an outgoing personality, a fashionable appearance, physical stamina, and good communication skills. Ability to work with other people and leadership skills are also necessary traits for success in management. Since some merchandising employees make presentations, these individuals must have good speaking voices and possess poise. Employees in sales must be competitive, goal oriented, and energetic. They must have the ability to communicate clearly. In addition, employees in the area of merchandising, fashion, and retailing profit from having a good knowledge of textiles, style, and current fashion trends.

Table 2.5 provides information on sample jobs available in the area of fashion merchandising and retail management. The table also shows descriptions and training requirements for the identified jobs.

◆ Essential Questions: ◆ Fashion Merchandising and Retail Management

1. What are the differences between specialty stores, department stores, and discount stores?

2. What personal qualities and skills are important for employees in the fields of merchandising, fashion, and retailing?

3. What are examples of fashion merchandising and retail management occupations that require various levels of training?

Fashion Merchandising and Retail Management

Example Jobs	Job Descriptions	Training Required		
		1	2	3
Stock Clerk	Receives, unpacks, and prepares merchandise for display on selling floor, restocks the selling floor as assigned, and maintains stock area(s).	✓		
Salesperson or Sales Associate	Uses personal selling techniques to determine each customer's needs and to persuade the customer to purchase specific goods or services to fulfill those needs.	✓		
Buyer	Purchases merchandise for the store, maintains balanced stock desired by the store's customers and stock that is consistent with the store's image, follows up on orders, and organizes trips to market.			✓
Product Developer	Develops product lines for the manufacturer or private label merchandise for the retailer.			✓
Product Manager	Functions as the head of the product development team that plans and develops a particular product, product line, or brand.			✓
Window and/or Interior Display Person	Plans and executes window displays and/or interior store displays to promote merchandise.		✓	
Department Manager	Supervises department's employees, completes departmental records, and serves as department buyer in some stores.		✓	
General Merchandise Manager	Oversees the buying, merchandising, and selling of goods for a store or group of stores in a manner consistent with the basic objectives of the firm.			✓
Marketing Researcher	Coordinates projects to gather information on consumer opinions, preferences, and feelings regarding specific products and service. Then recommends ways to improve the marketing of merchandise.			✓
Fashion Coordinator	Keeps informed of fashion trends and developments and acts as a source of fashion information in an organization.			✓
Fashion Reporter	Reports fashion news for magazines, newspapers, and broadcast media.			✓

1-Entry Level or High School 2-Advanced Training (School or Apprentice) 3-College or Professional Level

Table 2.5

PROFESSIONAL FAMILY AND CONSUMER SCIENCES OCCUPATIONS

Family and consumer sciences professionals are persons with at least a bachelor's degree in one area of family and consumer sciences. Besides the professional level jobs previously identified, there are a variety of family and consumer sciences occupations that require knowledge and training related to textiles and apparel.

A family and consumer sciences teacher is a professional with at least a bachelor's degree in family and consumer sciences education. Many family and consumer sciences instructors teach classes in different subject areas within family and consumer sciences, including textiles and apparel. Thus, a basic knowledge of textiles and apparel subject matter is necessary for any family and consumer sciences teacher. Family and consumer sciences professionals who teach at colleges and universities are usually required to have a master's degree and a doctor's degree. In some cases, these professors specialize in teaching one area of family and consumer sciences such as textiles, clothing, and merchandising. Such professionals are also usually required to conduct research in areas of interest related to their teaching fields.

Family and consumer sciences professionals hired by the Cooperative Extension Service teach subject matter related to textiles and apparel in addition to other family and consumer sciences subjects. These professionals provide instruction in formal settings such as classrooms and informal settings such as community buildings and homes. They also present radio and television programs, work with organized groups of youth and adults, and develop educational materials. Extension agents must be well-organized, be able to work well with people, and have a thorough knowledge of family and consumer sciences subject matter. In most states, a Family and Consumer Sciences Extension Agent must have at least a bachelor's degree in one area of family and consumer sciences.

Some companies hire family and consumer sciences professionals as consultants. For example, a retail firm might hire a family and consumer sciences specialist for a temporary time period to make recommendations regarding store layout and visual merchandising. Such temporary assignments are often called ***freelance work***. Freelance work is conducted by professionals who are not employed on a regular basis but who are hired to complete specific assignments.

In some cases, companies hire family and consumer sciences professionals as consultants in full-time, permanent positions.

Different companies attach different titles to these jobs. For example, a consultant for a pattern company might be called a consumer relations representative. This professional might answer customers' questions regarding the company's products and services, provide information to customers on clothing construction, and develop educational materials to promote the company's products and services. A sewing machine company might hire a family and consumer sciences professional as an educational representative to develop and present training programs for retailers who sell the company's sewing machines and educational programs for customers. Some clothing manufacturers hire family and consumer sciences professionals to promote their product lines and to educate consumers.

Sometimes family and consumer sciences professionals are hired in jobs that combine family and consumer sciences and another subject area, such as science. For example, an organization called the International Fabric Care Institute hires professionals with training in textile chemistry. These professionals test and evaluate dry cleaning chemicals, train and update dry cleaning professionals, and educate consumers. Some individuals with strong educational backgrounds in family and consumer sciences and business find that they have more employment opportunities because of the combined subject matter. Family and consumer sciences professionals with training in advertising or communications may be hired by broadcast media firms, newspapers, advertising firms, and other communications-related employers.

There are a variety of organizations, associations, and institutes related to the textile and apparel industries which provide employment opportunities to family and consumer sciences professionals. In most cases, these professionals represent the organizations and must have poise and the ability to make presentations to groups. Research laboratories in colleges, universities, manufacturing plants, and research centers sometimes hire family and consumer sciences professionals to conduct research related to textiles and apparel. Researchers must be able to enjoy working in laboratory settings, have good analysis skills, and be willing to attend to details.

◆ Essential Questions: ◆ Professional Family and Consumer Sciences Occupations

1. What are three examples of employment opportunities related to textiles and apparel that are available to family and consumer sciences professionals?
2. What are examples of freelance work that might be performed by a family and consumer sciences professional?

ENTREPRENEURIAL OPPORTUNITIES

An ***entrepreneur*** is a person who owns and operates his or her own business. An entrepreneur usually sells a new product or service. Entrepreneurs are usually hard workers who believe in the free enterprise system. ***Free enterprise*** is the freedom of individuals to organize and operate businesses for profit in a competitive system without governmental interference. Free enterprise is a characteristic of ***capitalism***, the economic system of the United States. Under capitalism, most production means are owned by private citizens. In a free enterprise system, entrepreneurs can earn profits by taking the risk of investing capital (cash) in goods used to produce goods or provide services. Capital is usually used to finance items such as furniture, equipment, machinery, buildings, fixtures, operating cash, and supplies. The ultimate goal of an entrepreneur is to make a profit. The entrepreneur risks both failing and losing his or her initial investment.

Most businesses in the United States are organized as either a sole proprietorship, a partnership, or a corporation. The ***sole proprietorship*** is a business owned by one person. A ***general partnership*** is a legal business relationship in which two or more individuals share responsibilities, resources, and profits equally. A ***limited partnership*** is a legal business relationship in which, according to a written agreement, some owners have a limited liability for business debts and are not involved in day to day operation of the business. These individuals are sometimes known as silent partners. A ***corporation*** is a legal business relationship in which a group of persons join to create an entity treated by law as a separate individual. Through its officers, the corporation makes contracts, conducts business activities, and assumes responsibility for debts.

One primary goal of businesses is to satisfy consumer demand for goods and services. Business functions include production of raw materials, manufacturing, wholesale operations, and retail sale to consumers. Small businesses are involved in all functions of business, but they primarily provide products and services to consumers through retail sale. At the retail level, many small businesses are franchises. A ***franchise*** is a right or license granted to an individual or group to market a company's goods or services. A ***franchiser*** grants a franchise and offers a proven market strategy for a product, service, or method. A ***franchisee*** is a person or group to whom a franchise is granted. Usually, a franchisee invests capital in exchange for the expertise and widely-known product image of the franchiser. Often, the fee includes the cost of inventory with which the franchisee begins business. Some apparel specialty stores are operated as franchises.

In some cases, entrepreneurs develop an idea for a product or service related to textiles or clothing and decide to create a business. It is important for the product or service to be one that is wanted or needed by enough people that the business can survive and eventually make a profit. Some entrepreneurs start their businesses at home and expand later as the businesses grow. An example of an entrepreneur is a family and consumer sciences professional who recognized the need for how-to books for home sewers and published a series of books on fitting problems commonly experienced by home sewers. Another example is an individual who designed a children's garment that can be lengthened as a child grows. The garments are produced and distributed to retailers who sell children's clothing.

Successful entrepreneurs are usually characterized by the following traits:

- individualism and initiative
- a pioneering spirit
- willingness to take a risk
- desire for self expression
- persistence
- creativity and inventiveness
- technical knowledge of how to operate a business
- ability to survive financially if emergencies occur
- patience to wait until the business becomes successful
- ambition, energy, and drive
- ability to make decisions
- ability to take full responsibility for decisions
- realistic expectations about the amount and types of work required
- ability to communicate
- resources to survive with lack of income

◆ Essential Questions: Entrepreneurial Opportunities ◆

1. What different types of business ownership options exist for entrepreneurs?
2. What traits do successful entrepreneurs typically possess?
3. What do you think would be advantages and disadvantages of being an entrepreneur?

Chapter Highlights

- ☆ The textile and apparel industries offer career opportunities for entry-level employees; individuals with advanced training through vocational schools, colleges, or apprenticeships; and people with college and graduate degrees.

- ☆ Apparel services jobs involve providing services to customers related to the planning, selection, maintenance, and care of apparel. Jobs are available in dry cleaners, laundry services, alteration and repair shops, and retail firms.

- ☆ Apparel production and management jobs involve producing basic and fashion apparel for purchase by consumers either through personal or industrial apparel production. Industrial apparel production is done through clothing manufacturers, jobbers, or contractors. Personal apparel production is the process of custom sewing garments for customers.

- ☆ Apparel manufacturers sell their goods to retailers each season and are usually involved in marketing to retailers during a time period called Market Week.

- ☆ Textile and apparel design jobs involve the development of original ideas for use in creating textiles and clothing. Jobs are available in design studios, print design studios, weaving mills, knitting mills, print plants, screen printing plants, and converters.

- ☆ Fashion merchandising and retail management jobs involve the buying, promotion, and selling of fashion goods. Jobs are available in retail firms and a variety of other locations.

- ☆ A family and consumer sciences professional is a person with at least a bachelor's degree in one area of family and consumer sciences. Job opportunities for family and consumer sciences professionals include teaching; employment with the Cooperative Extension Service; freelance work; consulting for companies; representing various organizations, associations, and institutes; and conducting research.

- ☆ Entrepreneurs are people who own and operate their own businesses. Through the free enterprise system, entrepreneurs invest capital in goods used to produce goods or provide services. Business ownership options include sole proprietorships, limited partnerships, corporations, and franchises.

Chapter 3

Employability Success in the Textile and Apparel Industries

Chapter Focus

The following Essential Knowledge and Skills are discussed in this chapter:

- 2A Identify routine tasks that employees may perform.
- 2B Follow procedures identified for performing tasks.
- 2C Apply resource management procedures when completing assigned tasks.
- 11A Demonstrate effective verbal, nonverbal, written, and electronic communication skills.
- 11B Demonstrate effective methods to secure, maintain, and terminate employment.
- 11C Demonstrate positive interpersonal skills including conflict resolution, negotiation, teamwork, and leadership.
- 11D Evaluate the relationship of good physical and mental health to job success and achievement.
- 11E Demonstrate appropriate grooming and appearance for the workplace.
- 11F Demonstrate appropriate business and personal etiquette in the workplace.
- 11G Exhibit productive work habits and attitudes.

Chapter Vocabulary

approach
buying change
change fund
communication
demonstration
etiquette
inventory
perpetual inventory
Point of Sale (POS) System
positive sales closer
sales check or sales slip
sales commission
scanners or optic readers
statement
stock
till

EMPLOYABILITY SKILLS

Employees need many characteristics and skills to be successful. Employers look for these traits and skills when people apply for jobs. Employers also consider these qualities when evaluating employees after they are hired.

To be successful in any job, a person needs to honestly evaluate personal strengths and weaknesses and then work on areas needing improvement. Personal qualities, interpersonal skills, performance of routine tasks, and specialized skills can all be improved through conscious effort.

Effective Communication

Being able to communicate ideas and understand others is a basic skill for dealing successfully with customers, co-workers, and managers in any job. ***Communication*** is the process by which ideas, feelings, and information are shared. In order for communication to occur, a message must be sent and received. Therefore, the sender and receiver are both vital to the communication process. The flow of communication is influenced by various factors including personalities, perceptions, ideas, sensitivities, and communication skills of the sender and receiver.

Verbal and nonverbal communication constantly occur between people. Each time you speak or act, you send a message to others. Facial expressions, appearance, and gestures all send certain messages. In order to communicate what you intend to communicate, these messages must be sent in a way that the receiver will understand.

Employers value employees who demonstrate good communication skills. Being successful in a job requires good verbal, nonverbal, and written communication skills. With increased use of computer technology, electronic communication skills are increasingly important to job success.

Verbal communication includes word messages presented to others in person, through writing, and over the telephone. Verbal communication is the most obvious aspect of communicating with customers. The successful employee projects courtesy, sincerity, honesty, and other positive traits through verbal communication. Developing a broad vocabulary, using an appropriate tone of voice, and using correct grammar are important parts of verbal communication. Knowing when to speak, when to remain quiet, and when to refer problems to other employees are also important. Use of the latest slang terms should be avoided when communicating with customers. It is best for employees to use conservative speech when completing customer transactions.

Telephone Communication. Effective telephone communication skills are needed to secure or maintain employment. Each time an employee answers a business telephone, his or her voice and manner of speaking represent the business. It is important to give the best impression possible to all persons who call. Tone of voice, pronunciation of words, and pitch or intensity of the voice influence effective telephone communications.

It is also important for an employee to be organized and informed when communicating by telephone. Callers expect to receive information quickly and efficiently. Therefore, putting callers on hold for long periods of time is not recommended. Suggestions for telephone usage are included in figure 3.1.

Telephone Usage

General Guidelines

- Keep important telephone numbers by the telephone. Include numbers for the police, fire department, physician or hospital, emergency service, and personnel of the workplace.
- Become familiar with telephone terms such as the area code, collect call, and person-to-person call; the local telephone book; and any specific telephone information for the employment situation.
- Keep paper and pencil near the telephone to efficiently record messages, names, and other important information.
- Speak clearly and distinctly. Do not chew gum, candy, or food while using a business telephone.
- Focus attention on the telephone conversation, and avoid unnecessary interruptions.
- Do as follows when it is necessary to leave the line:
  - Explain why the caller must be put on hold.
  - Express appreciation for the person's time when returning.
  - Check with the caller periodically if he or she must wait for several minutes.

Receiving Calls

- Answer the telephone promptly when it rings.
- Follow company policy and the supervisor's instructions regarding how to answer the telephone.
- Record the names of unfamiliar callers.
- Do as follows when taking a message:
  - Record the caller's full name. To ensure accuracy, ask the caller to spell his or her name.
  - Ask for the caller's telephone number. Repeat the number to ensure it has been recorded correctly.
- Be courteous to individuals who have reached the wrong number.

Placing Calls

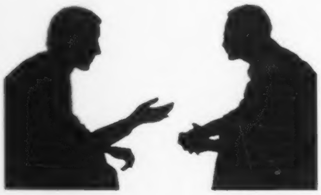
- Plan before placing a call by preparing a list of items to be discussed. Check each item off as it is discussed.
- Identify yourself and the name of the establishment represented.
- Record important points discussed during the conversation.
- Be courteous and apologize when a wrong number is reached.
- Limit personal telephone calls to emergencies and urgent matters.

Figure 3.1

Communication with Customers in Person. Both verbal and nonverbal forms of communication are important when dealing with customers in person. Nonverbal communication includes facial expressions, posture, movement, hand and arm gestures, sighs, grunts, groans, and overall body language. In order to maintain positive customer relations, it is important for employees to be aware of nonverbal and verbal forms of communication that are most effective in encouraging customer satisfaction. It may be helpful to practice videotaped role play situations to identify ways to improve communication skills.

When speaking to a customer or co-worker, it is important to show people that you like them. Use the following basic rules of conversation in order to be a better communicator:

- Avoid talking too fast.
- Do not be afraid of silence.
- Pronounce words clearly.
- Learn to listen to others.
- Avoid total disagreement with customers when they express their opinions.
- Be tolerant of the other person's point of view.
- Avoid monopolizing a conversation by telling every detail of a story.



Listening. Listening is a communication skill that is often overlooked. It is one of the most difficult skills to learn, but it is one of the most important. Messages must be sent as well as received for communication to occur. Therefore, communication fails when a person does not listen to the message sent. The ability to receive a message is as important as the ability to send a message.

Listening is a skill that can improve communication and relationships in every area of life. On the job, listening improves relationships with customers, co-workers, and supervisors.

Listening is not the same as hearing. Both hearing and listening use the ear, but listening involves understanding what is heard. It requires concentration and effort.

To improve listening ability, concentrate on the speaker instead of planning a reply or thinking about personal matters. Avoid the habit of daydreaming instead of listening. Avoid paying attention to distractions such as noises and other conversations. Show interest in the speaker through actions such as the following:

- Look at the speaker. Make eye contact.
- Use body language, such as nodding, to show that the message is being understood.
- Occasionally interject such responses as "I see," "How interesting," or "I'll do that right away."
- If something is not understood, ask questions to clarify the message.

Successful Customer Relations

Positive interpersonal skills are important in maintaining good customer relations. Traits such as friendliness, cheerfulness, courtesy, and tact are important in dealing with customers. Positive traits cannot be developed just by reading about them. It is necessary to practice using these traits in order for them to become a part of everyday behavior. It is necessary to display a genuine interest in people in order to influence them.

Friendliness involves displaying an attitude that is pleasant and warm. Customers enjoy entering a business where employees greet them in a friendly, natural manner. The friendliness of employees creates a relaxed atmosphere in which customers feel comfortable. Customers are more likely to make a purchase from a friendly salesperson. Friendly people establish a sense of trust with customers. Friendliness also helps establish a pleasant atmosphere by creating trust and cooperation among co-workers.

Cheerfulness involves being the kind of person others like to be around. People who are sullen and moody and complain frequently are not the types of people others enjoy. Cheerful people tend to make others cheerful. Sharing a smile with others is one of the most important rules of making friends and influencing people. A sense of humor is closely related to cheerfulness. A person with a good sense of humor has the ability to see the less serious side of issues and makes the best of difficult situations. It is important to maintain a good sense of humor in a job situation without becoming crude, rude, or inappropriately loud. A cheerful employee will respond by saying "sure" or "I would be glad to" when asked to help with unexpected work rather than grumbling or complaining. Remaining cheerful and staying busy improves the attitudes of other people.

Courtesy involves the consistent use of good manners. A courteous person shows respect and consideration for others while showing a willingness to cooperate. Customers feel comfortable and appreciated when treated in a courteous manner by employees. "Please" and "thank you" are examples of courteous phrases. Discourteous habits such as interrupting people before they finish speaking or responding to another person with a rude remark should be avoided.

Tact is the ability to say and do the right thing at the right time. Employees can become more tactful by considering the customer's point of view. As an employee, think about how a customer likes to be treated and put those ideas into practice with customers. Avoid gossiping or visiting loudly with other employees while customers are waiting to be assisted. Avoid criticizing others or sharing confidential information. Never repeat the criticism and complaints of others. In a difficult situation, try to say something kind or pleasant rather than responding negatively.

Tact is very important when dealing with customers directly. For instance, an employee assisting a person who is trying on shoes that are too small should tactfully suggest trying another size by saying something like, "Let me bring you that shoe in another size. We have found that this line tends to run unusually small." Considering the customer's feelings always helps to maintain positive relations.

Short Course in Human Relations

The six most important words — "I admit I made a mistake."

The five most important words — "You did a good job."

The four most important words — "What is your opinion?"

The three most important words — "If you please."

The two most important words — "Thank you."

The one most important word — "You"

The least important word — "I"

Source: Southwestern Bell Telephone Company

Figure 3.2

Appropriate Grooming & Appearance

Good grooming and personal appearance are important factors in achieving job success. The way a person looks affects the way others react toward that individual. The way a person looks also affects the way that individual feels about himself or herself.

All employees can profit from good grooming and appearance. Make a point to learn the dress code for a specific place of employment, including any rules regarding personal appearance. Observe the clothing and appearance of experienced, successful employees, and use them as examples to follow.

It is especially important for employees who meet the public to pay careful attention to having a fashionable and neat appearance. When selling, merchandising, and promoting apparel, it is particularly important that employees make a good impression on customers. Use the following guidelines to help develop a positive and pleasing appearance.

- Stay aware of fashion trends and choose clothing that is fashionable.
- Choose sensible clothing that is appropriate for the employment situation.
- Select clothing that fits properly.
- Make needed repairs to clothing on a regular basis.
- Check clothing and general appearance before going to work.
- Select sensible shoes that are clean and in good repair.
- Have hair cut or trimmed on a regular basis in an appropriate style.
- Wash hair as needed to maintain cleanliness, and style hair daily.

- If female, apply moderate amounts of makeup to a clean face.
- If male, shave and/or neatly trim beard or mustache.
- Keep hands cleaned and nails well manicured.
- Take a bath or shower daily and use a reliable deodorant.
- Maintain proper posture when sitting, standing, and walking.
- Practice good dental hygiene.
- Make a habit of smiling.

Although many physical traits, such as height and basic body type, cannot be changed, every person can develop a positive and pleasing appearance. Rather than worrying about a trait or aspect of physical appearance that cannot be changed, try to improve those that can. Make a plan for self-improvement by identifying positive traits to develop, and then work to put the plan into practice.

Business and Personal Etiquette

Etiquette is the set of rules about the proper way to interact with people. It is commonly referred to as "good manners."

Knowing the rules makes a person much more comfortable in any situation, whether it is a personal or business setting. Observing rules of good manners helps a person project a positive image to others, and it makes others feel more comfortable around that person.

Etiquette covers many of the skills and traits that have already been discussed. Some examples of workplace etiquette include the following:

- Be courteous to co-workers, supervisors, and customers. Show respect and consideration for others. This may involve calling persons by their proper title, using "Please" and "Thank you," and respecting the privacy of persons in the workplace.
- Learn and practice special rules of etiquette, such as how to make introductions, shake hands, respond to invitations, and write thank-you notes.
- Learn good table manners, and practice them until they become a habit. Many employees have occasion to eat with co-workers or supervisors or to entertain a customer at a meal. In those situations, it is important to be comfortable with rules of meal etiquette.
- Learn and observe rules of conduct that relate to a specific place of employment.
- Recognize the diversity of people in the workplace. People in the workplace typically differ in gender, age, culture, and many other ways. Be respectful of differences. Recognize that people think and react differently depending on the experiences they have had.

Productive Work Habits and Attitudes

A successful employee is one who is productive - who gets the job done. Being a productive employee requires learning special skills for specific tasks. It also requires developing good general work habits and keeping an overall positive attitude.

Positive Work Habits. From the first day on a job, an employee should attempt to set good work habits. Practicing good work habits not only makes the job easier for the employee, but it also impresses the employer. Examples of positive work habits include the following:

- Use equipment carefully. This shows respect for the work environment and promotes safety.
- Be prompt about completing tasks and stay busy at work.
- Show willingness to learn new or more efficient work techniques.
- Show interest and enthusiasm for assigned tasks. This improves the employee's own

attitude and results in a better environment for others.

- Avoid letting yourself become bored and easily distracted.
- Become aware of annoying personal habits such as loud laughing, gum chewing, or fingernail biting. Correct any habits that need to be corrected.

Teamwork and Cooperation. Employers have said that one of the most important traits they want an employee to have is the ability to work with others. A productive team employee is one who cooperates willingly with others - who is an effective team member.

Cooperation involves willingness to listen to other people's views and opinions and to work toward common goals. Employees should learn and follow the policies of their employers. They should be willing to complete all assigned tasks with a positive attitude. Even if personality clashes exist between two employees, it is important for both individuals to set aside petty differences and work together as well as possible. An employee who is willing to cooperate with co-workers and supervisors without insisting on doing things a particular way contributes to a positive, productive work environment for everyone.

Accuracy and Initiative. Being accurate means getting the job done without mistakes. It requires paying careful attention to instructions and then following procedures correctly. The accurate employee is attentive to details rather than being careless in work habits. When unsure about what to do, it is smart to ask questions rather than perform a task incorrectly. However, it is important to listen closely so that instructions do not have to be repeated often.

Initiative involves taking the lead to get work done. After completing an assigned task, the productive employee takes the initiative to look for the next task that needs to be done. An employee who always waits around to be told to start the next assignment wastes a lot of time, gives an appearance of laziness, and ends up accomplishing less than someone who shows initiative.

Dependability, Honesty, and Promptness. A supervisor should be able to depend on an employee's performance, honesty, and promptness even when the employee does not feel well. Dependability means consistently following through with tasks and responsibilities. The dependable employee can be counted on to maintain high standards and produce quality work even when working under pressure or when the work seems boring.

Honesty involves maintaining high ethical standards, telling the truth, and handling the employer's possessions and money with care. Dishonesty is a common reason for terminating employment.

Promptness means being on time and completing assigned tasks in a timely manner. The prompt employee arrives at work on time and gets right to work. Whenever an employee is unable to report to work, it is important to call as early as possible.

Self-control. There are times in any job situation when problems occur and it may be difficult to remain calm. However, a successful employee keeps his or her temper under control and avoids unpleasant confrontations with customers, other employees, and supervisors. The following suggestions help a person maintain calm and controlled:

- Consciously work to maintain a pleasant disposition.
- Pause to think before speaking or taking rash actions.
- Learn to remain calm in difficult situations.
- Work hard to perform well and obtain the respect of supervisors and co-workers.
- Learn to accept constructive criticism and remain friendly.

Positive Attitude. Attitude can be defined as the way a person thinks and feels, which influences the way that person acts. A positive work attitude involves thinking about work in a favorable manner. A person who demonstrates a positive attitude can more easily secure and keep a job.

A positive attitude toward the employer, other employees, and the job benefits everyone involved. It helps a person deliver high quality performance and makes the job more enjoyable. Also, demonstrating a positive attitude is contagious. It makes others feel better about themselves and the workplace, and it promotes a positive impression of the employee who displays the positive attitude.

Ways that a positive attitude may be demonstrated include the following:

- Show enthusiasm for the tasks you perform.
- Demonstrate a willingness to learn and improve.
- Demonstrate loyalty to your employer.
- Speak positively about people with whom you work. Avoid gossiping or making negative comments about other employees or supervisors.

Physical and Mental Health. An employee's physical and mental health directly impacts job success. Being productive at work requires energy and concentration, which are products of good health. Good health also contributes to a positive attitude.

Although a person cannot control all factors that impact health, there are many things a person can do to be healthy. A good diet, regular exercise, and the proper amount of rest all contribute to good health. It is also important to learn how to balance one's activities and manage stress.

◆ Essential Questions: Employability Skills ◆

1. Why is communication considered a two-way process?
2. How can you become a better listener?
3. What are examples of traits that contribute to successful customer relations? How?
4. Why is it important to practice appropriate etiquette in the workplace?
5. What are five examples of productive work habits? How does each contribute to successful employability?
6. What can a person do to improve physical and mental health?

ROUTINE TASKS COMMON TO MANY TEXTILE AND APPAREL OPERATIONS

Several routine tasks are commonly performed by employees in many textile and apparel operations. Examples include office work and paper work, opening and closing routines, receiving and handling cash, housekeeping tasks, and inventory tasks.

Office Work and Paper Work

Operating a business of any kind involves record keeping and other paper work. Having the right forms makes work easier and makes a business appear professional and organized. Keeping accurate records helps a business owner pay income tax, make social security payments, and calculate income per hour and per job.

A ***statement*** is a written bill. Statements of two or three colored carbonless sheets are sometimes used by businesses. Some firms use personalized statements with the name, address, and telephone number of the business printed at the top of each form. Other businesses may use a generic form. The copies of the statement are necessary in order for the business to retain a copy while providing the customer with a copy. It is important that all needed information be recorded on the statement when a business transaction is made. In some cases, employees record information by hand. In other businesses, employees use a computer to type information on statements. Some computerized cash registers print a sales receipt with detailed information so that a statement is not required.

A ***sales check*** or ***sales slip*** is a written record of a sale. Different stores use different types of sales checks. The sales check serves as a receipt for the customer and as a record for the store showing that merchandise was sold. The types of information that may be included on a sales check include the date, customer name and address, salesperson identification, type of transaction, merchandise purchased, and price. It is important that new employees learn the procedure for completing a sales check if the procedure is a routine part of their jobs. In some businesses, sales checks are produced by computerized cash registers when the employee enters the needed information into the cash register. Employees should become aware of the required information for producing a sales check at a particular business and develop a system for checking to ensure that no information is omitted.

In addition to completion of various types of paper work, some employees are required to complete other routine tasks such as filing. Each business has its own filing system, and the specific system should be followed carefully to ensure that records are easy to find and use. Answering the telephone and greeting customers are two more routine operations required of many employees.

Opening and Closing Routines

Some employees are required to perform routine operations for a business at opening and closing times. The opening and closing routines vary for each business. In a retail operation, examples of opening routines include the following:

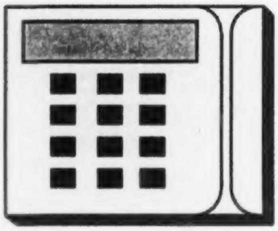
- turning on the lights
- securing change for the cash register from a location such as the cashier or business department
- counting change and placing it in the cash register
- checking to make sure that needed supplies (such as sacks, plastic bags, clothing hangers, statements, and sample items) are available
- having equipment stored in the correct locations for use

Examples of closing routines include the following:

- turning off the lights
- counting the cash in the cash register
- returning money from the cash register to the business department
- completing end-of-the-day reports and records

Operating a Cash Register or Point-of-Sale (POS) System

Different stores use different types of cash registers. The type of cash register used depends on the amount of business done and how much detailed information the retailer wants to know about sales transactions. Some computerized registers allow the salesperson to record the price of the merchandise sold,



the department, the classification of the merchandise, the identification of the salesperson, an item description, and the type of sales transaction. The sophisticated ***POS system*** will also capture important consumer data. After the initial training period, most employees find cash registers easy to operate.

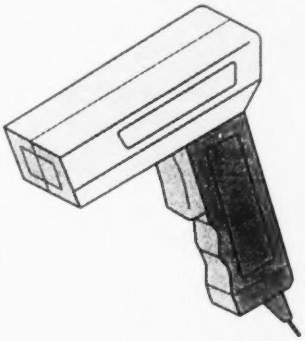
For many years only manual cash registers were available for use in retail businesses. Now that electronic and computerized cash registers are available, fewer manual cash registers are used. However, some stores may still use manual cash register models.

Computerized cash registers have many features that make the salesperson's job easier. For example, some cash registers automatically calculate the sales tax for each sale. If the cash register does not have this tax calculation feature, the salesperson must usually refer to a tax chart to identify the amount of tax the customer owes on the merchandise purchased.

Another convenient feature of some cash registers is the calculation of the amount of change the customer is owed. After the salesperson enters the amount of cash the customer is paying, the cash register will automatically subtract the amount of the sale from the amount tendered (paid) and display the amount of change owed. When cash registers do not have this feature, the salesperson must calculate the amount of change the customer will receive. Having such a feature on a cash register may reduce the number of mistakes made by salespeople.

In some cases, each salesperson is assigned a special code or key on the cash register so that the proper person will receive credit for sales made. The salesperson presses the assigned key or enters the assigned code before entering each sale on the cash register in order that appropriate credit is given. In some cases, this method is used to calculate a salesperson's sales commission. ***Sales commission*** is the amount of money a salesperson earns from each sale. Some stores pay salespeople based on commissions while others pay salespeople salaries.

Some cash registers are part of a computerized information system that includes scanning devices. Scanners are also called optic readers. ***Scanners,*** or ***optic readers,*** automatically read the price of an item and enter it into the cash register. Special tags or labels must be attached to the merchandise in order for the scanner to function. When a hand-held scanner is passed over the special tag or when the item is passed over a scanner installed inside a sales desk, the scanner reads the special information on the tag. In addition to recording the cost of each item, the scanner can record what was sold so that the retailer has an automatic inventory recording system.



A charge purchase by a customer can be immediately added to a customer's account with a computerized cash register. A computerized system updates the store's records and eliminates the need for employees to manually post (record) charges to each customer's account. As a result, records are neat and orderly and the customer has access to account information at any time it is needed.

Some cash registers are designed to print and issue a receipt automatically each time a transaction is completed. Some stores provide receipts with detailed information. A cash register receipt with information such as the date, the amount of the sale, the salesperson's identification, the department, and the type of transaction can eliminate the need for a sales check.

Even when using computerized cash registers, salespeople may make mistakes. The most common errors made involve carelessness, entering the wrong prices, and entering the wrong departments for the merchandise sold. Salespeople may enter wrong price information because of inaccurate information on the merchandise tag, lack of training on the price of one item when a special multiple item pricing sale is in effect, and lack of attention to or memory of sale advertisements. It is important for salespeople to correct mistakes made immediately. Each store has a special procedure that should be followed in correcting cash register mistakes. Some stores require a salesperson to complete a form to void the mistake so that there is a record of the mistake. Some mistakes will be expected when a person first begins using a cash register. However, continued carelessness and excessive mistakes may not be excused by supervisors.

Handling Money

As mentioned previously, one routine task of a salesperson is to obtain money at the beginning of the work day. Each business has special procedures to follow in handling money. The money placed in the cash drawer at the beginning of the business day is usually called the ***change fund***. The salesperson should always count the change fund before beginning to use it. In some stores, each assigned salesperson carries a till to the business department or cashier's office to obtain the change fund for the day. The ***till*** is the removable tray that has divided compartments for different denominations of coins and bills. In most cases, the till slides in and out of the cash drawer portion of the cash register. The till usually has a lid that should be closed when carrying the change fund to and from the business department.

Throughout the work day, the salesperson should check to make sure there is enough change in the cash drawer of the cash register. Having to get more change during a sales transaction delays the customer. ***Buying change*** is the term used to describe obtaining change from the cashier or business office. The salesperson should count a specific amount of money in the cash drawer, remove the money, and close the cash drawer. The bills removed from the drawer are used to buy the same amount in needed change. After obtaining the needed change, the change is placed in the appropriate compartments in the cash drawer of the cash register.

Housekeeping Tasks

Employment in almost any job involves some routine housekeeping tasks. Typical tasks include vacuuming the carpet in selling floor areas, returning sample books to appropriate locations, straightening merchandise, cleaning the work area before leaving for the day, and returning equipment and supplies to proper storage places. Most large housekeeping tasks are completed by employees hired specifically to do cleaning, repair, and maintenance work. However, completion of routine housekeeping tasks by all employees helps in maintaining an organized and attractive environment.

Inventory Tasks

Taking inventory is the process of counting the number of items on hand. ***Inventory*** refers to the sum total or results of the counting process. Inventory management describes the decision-making process regarding what and how much merchandise to carry in a store's stock. **Stock** is the sum total of merchandise carried by a store. When inventory is maintained carefully, a business can reorder merchandise wanted and needed by customers before the supply has been sold. When inventory management is done carelessly, a business may run out of merchandise needed and wanted by customers or be over-stocked at the end of a season.

Inventory management is important to the process of successful retailing. Two types of inventories are part of most inventory management systems. One inventory is an estimated count based on written records or computerized records from the computerized cash register system. This is known as the ***perpetual inventory***. The second type of inventory is an actual physical count of merchandise. All the merchandise documents that employees are required to complete are a part of the estimated count of merchandise in the store. Therefore, record keeping is very important and must be as accurate as possible. Employees are asked to do the physical count of merchandise to accurately update the perpetual inventory system.

◆ Essential Questions: ◆ Routine Tasks Common to Many Textile and Apparel Operations

1. What are five examples of routine tasks common to many textile and apparel operations?
2. Why are accurate records important to a business?
3. How has the operation of cash registers or POS systems been improved through technology?
4. Why is accurate inventory management important?

SALES AND SERVICE

Various types of transactions are completed in businesses. Each employee should receive training to carry out assigned responsibilities. For instance, a salesperson in an apparel retail store might be required to answer questions about merchandise, trends, and sizing; be familiar with merchandise available in the store; assist customers in trying on merchandise; help customers reach buying decisions; complete different types of purchase transactions (such as credit, cash, check, and layaway); deal with customer complaints; handle merchandise returns; refer customers to other service areas in the store; and provide various services (such as gift wrapping or delivery) as assigned. With the variety of jobs available in the textiles and apparel industries, it should be noted that each job is unique and will require an employee to carefully follow directions provided by the supervisor.

Sales Transactions

The selling process involves several important steps. The **approach** is the greeting used to gain the customer's attention. A good approach creates a favorable impression of the store and the salesperson. The approach should be nonthreatening, put the customer at ease, build confidence in the salesperson, and involve the customer with the store's merchandise. Different approaches may be chosen by a salesperson depending on the situation. An informative comment about the merchandise may be used. A personal approach may be used if the salesperson knows the customer's name. The salesperson may also use a service approach by offering assistance to the customer. When busy with a customer and another customer approaches, the salesperson should acknowledge the second customer's arrival and assure him or her that assistance will be available soon.

After approaching a customer, the salesperson should listen attentively to determine the customer's needs. Asking a few well-chosen questions helps the salesperson determine customer needs. Asking a customer too many questions becomes annoying. The salesperson should suggest appropriate merchandise alternatives to the customer. If the customer requests an item the store does not carry, the salesperson may tactfully suggest a substitute item to fill the identified need.

The salesperson should handle merchandise properly when showing it to the customer. Demonstrating the merchandise may be necessary in some cases. A ***demonstration*** shows the customer that the item has the traits described by the salesperson. For example, allowing a customer to try on a jacket reported to be very comfortable emphasizes the positive points of the product. It is important to remember that customers do not really buy merchandise. They buy what the merchandise will do for them. Therefore, customers have increased satisfaction when shown what the merchandise will do to satisfy their needs.

The salesperson should use positive sales closers. A ***positive sales closer*** is a question used at the end of the sale to encourage an answer confirming the customer's choice of merchandise. The salesperson might ask a question such as, "How many are you needing? These are less expensive if you buy three." or "Did you like the red or the blue one best?" Remaining positive at the close of a sale both encourages the sale and maintains a pleasant relationship with the customer.

The salesperson must prepare the merchandise for the customer carefully and efficiently after a decision has been made. The accurate and efficient preparation of a sales check according to the store's policy is important to the customer and to the store. Learning how to manage different types of purchases such as cash, credit, layaway, and gift certificates is also important. Thanking the customer at the end of the transaction is a positive way to leave a lasting impression of the store.

Some employees are involved in working on a selling floor, while others may be employed to transact catalog sales or telephone sales. It is important to use general guidelines for selling, follow the supervisor's instructions, and serve the customer attentively in any form of sales transaction.

Service Transactions

Some textile and apparel-related businesses sell services to customers. For example, dry cleaners sell the service of providing clean, well-pressed clothing. Alteration establishments sell the service of adjusting clothing to fit the customer's needs. Custom sewing businesses create custom-fitted garments for consumers. Any service purchased by customers must be provided promptly and efficiently in order to maintain good customer relations. Since customers pay for these services, businesses must provide the best quality of work possible and fulfill agreements with customers.

Many retail stores provide services to customers in addition to the merchandise sold in the store. Customer services that may be provided by retail stores include alterations, packaging, gift wrapping, delivery, shipping, special ordering, custom-made services, and repairs. Employees are needed in each of these and many other service areas in order to provide customers with the services they need and want. Many service-oriented occupations offering new job opportunities have developed during recent years. Trends toward consumers using more services such as wedding consultation, personal shopping services, and fashion consultation indicate the consumer's desire for service. In each of the service-oriented occupations, learning to deal with customers is vital to the success of a business.

Managing Customer Complaints

Employees may have to handle complaints from customers either in person or by telephone. It is usually easy to use a pleasant voice when a customer is courteous. However, when a customer is upset and angry, the employee must handle the situation carefully. It is important for an employee to follow the rules of the firm in dealing with complaints. It is also important for an employee to maintain a positive and pleasant composure. Showing empathy to the customer will also help. Empathy involves seeing and feeling something the way another person sees and feels. Empathy can be shown by what is said and how the message is presented.

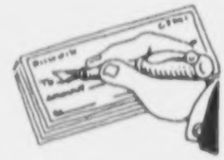
When dealing with a customer complaint, the following suggestions may help solve the problem and satisfy the customer:

- Remember that the customer is not personally attacking you.
- Allow the customer to tell his or her story without interruptions.
- Listen intently and use a sympathetic tone of voice to reassure the customer.
- Let the customer know that you are concerned by the way you speak and by your choice of words.
- Assure the customer of the firm's desire to solve the problem and suggest possible alternatives, or contact a person who is authorized to deal with the problem further.
- Remain relaxed and courteous. Do not let the customer upset you.
- Remember that without customers, a business would not exist. View a customer complaint as an opportunity to prove to the customer that the business really cares about people and wishes to fulfill customer needs.

Managing Sales and Returns of Merchandise

Retail salespersons frequently manage sales and returns of merchandise. The most common sales transactions are cash, charge, and layaway sales. Most stores consider checks to be cash sales. Some stores also sell gift certificates. Returns may involve an exchange or a refund of the customer's money. In some cases, a customer may owe an additional amount for a different item he or she selects.

When a salesperson receives payment for merchandise sold, the transaction is considered a ***cash sale***. When the customer uses a check to pay for merchandise, most businesses require the salesperson to check the identity of the customer. One method used is to request to see the customer's drivers license in order to compare the signature on the check with the signature on the license. Usually the salesperson also records the customer's drivers license number on the check. Some businesses require the salesperson to have checks verified by a department manager. Checks may also be processed through a security checking system that communicates with a central computer to identify bad checks.



When a customer receives merchandise and agrees to pay for it later, the transaction is called a charge sale or charge. A business may allow customers to open a charge account with the store and may provide each customer with a charge card for use each time a charge sale is transacted. Many retail businesses also accept major credit cards. For each charge sale, the salesperson is expected to complete a special form that describes the merchandise being purchased. In addition, the salesperson must have the customer place his or her signature on the form. By signing the form, the customer legally agrees to pay for the merchandise.

A ***layaway sale*** involves the store taking an item out of stock and holding it for a customer who agrees to pay for it over a specific period of time. Layaway is considered a customer service. The customer is usually required to make a deposit on merchandise placed in layaway. The balance of the purchase must usually be paid within two, three, or more months. If the customer does not complete the payments within the specified time period, the store returns the item to stock.

A customer may wish to return a purchase because the merchandise is defective or because the customer made a mistake in selecting the merchandise. Stores accept returns of defective merchandise unless the merchandise was sold "as is" during sales. Each store may set its own policy regarding returns of merchandise for other reasons. Many stores set a time limit, such as ten days or two weeks, within which returns will be accepted. The customer may be required to present a sales receipt when returning merchandise. Some stores will refund a customer's money when a return is transacted. Other stores may give the customer in-store credit that may be used later in purchasing other merchandise. In this case, the customer may receive a ***credit slip***, which is a completed form noting the amount of credit the customer may use to purchase merchandise. A few stores only allow the customer to exchange the merchandise for other merchandise.

◆ Essential Questions: Sales and Service ◆

1. What steps are involved in the selling process? Give an example of what you might say at each step in the process.
2. How does showing empathy to the customer help in managing customer complaints?
3. What are the three most common types of sales transactions?

Chapter Highlights

- To be successful in any job, a person needs to honestly evaluate personal strengths and weaknesses and work on areas needing improvement.
- Verbal communication includes word messages presented to others in person, through writing, and over the telephone. Nonverbal communication includes facial expressions, posture, movement, hand and arm gestures, sighs, groans, and overall body language.
- Positive interpersonal skills are important in maintaining good customer relations. Traits such as friendliness, cheerfulness, courtesy, and tact are important in dealing with customers. Positive traits must be practiced in order to become a part of everyday behavior.
- Good grooming and personal appearance are important factors in achieving job success.
- Observing proper etiquette helps a person project a positive image to others, and it makes others feel more comfortable around that person.
- Being a productive employee requires developing and practicing positive work habits. It also involves displaying traits such as teamwork, cooperation, accuracy, initiative, dependability, honesty, promptness, and self-control.
- A positive attitude toward the employer, other employees, and the job benefits everyone involved. It helps a person deliver high quality performance. Also, it makes the job more enjoyable for the employee as well as others in the surrounding workplace.
- Several routine tasks are commonly performed by employees in many textile and apparel operations. Examples include office work and paper work, opening and closing routines, receiving and handling cash, housekeeping tasks, and inventory tasks.
- The selling process involves several important steps. Steps include the approach, determining the customer's needs, suggesting merchandise and responding to questions, demonstrating the merchandise, and using positive sales closers.
- Employees may handle customer complaints either in person or by telephone. In handling complaints, it is important for an employee to maintain a positive and pleasant composure. Showing empathy to the customer is also helpful.
- The most common sales transactions are cash, charge, and layaway sales.
- Each store may set its own policy regarding returns of merchandise. The employee should know the store's policies when assisting customers with returns.

Chapter 4

Workplace Safety

Chapter Focus

The following Essential Knowledge and Skills are discussed in this chapter:

2D Utilize safe and effective work habits, procedures, and time schedules for completing prescribed tasks.

5B Demonstrate safety practices when completing apparel production tasks.

6G Demonstrate safety practices when completing tasks related to the alteration, repair, and customization of textile and apparel products.

7B Explain how regulations pertaining to workplace safety, labor, and environmental issues affect the commercial textile and apparel care operation.

Chapter Vocabulary

cardiopulmonary resuscitation (CPR)
Certificates of Occupancy
ergonomics
MSDs
negligence
Occupational Safety and Health Act of 1970
Occupational Safety and Health Administration (OSHA)
worker's compensation laws

Every year, many employees experience either job-related injuries or illnesses. The manufacturing industries usually report the largest numbers of workplace injuries. Department stores also report large numbers of injuries.

A total of 5.9 million injuries and illnesses occurred in private industry workplaces during 1998. This equals 6.7 cases for every 100 full-time workers. Textile and apparel operations and their staffs are concerned about the safety of employees, customers, and clients. Businesses are also required by federal law to provide a safe environment and a hazard-free workplace.

SAFETY RESPONSIBILITIES

Both employers and employees are responsible for workplace safety. Employers have the responsibility for providing a safe work environment and appropriate training to ensure safe employee practices. Employees are responsible for using safe practices in performing all tasks. Employees also share the responsibility for maintaining an overall safe work environment.

General Safety Programs and Procedures

Today, there is an increased potential for liability when employees and customers are injured. Liability is the state of being legally responsible or under obligation for loss or damage. When evidence shows that a business is negligent in providing for safety, the business can be held liable. ***Negligence*** is failure to use a reasonable amount of care when such failure results in injury or damage. While a business is unable to prevent all accidents and injuries, each business is expected to establish a safety program. A safety program will help prevent accidents and, in the event of legal action, serve as proof that the business made every effort to provide a safe environment. Businesses should purchase liability insurance and worker's compensation insurance for their protection against the potentially high cost of accidents and injuries.

Businesses, especially those involved in the manufacturing or cleaning processes, should prepare employees to properly handle emergencies. The enforcement of safety rules and occasional drills are important to being prepared. It is easy to get involved in the routine operations of a business and forget about emergency plans and drills. Initial reactions to an emergency greatly affect the outcome of the situation. Employees must know how to handle emergencies without hesitation so they can effectively calm people, move people to safety, avoid further injuries, limit liability, and control property damage.

Owners, managers, and employees are responsible for making sure their business operation complies with government health and safety regulations. These regulations exist to help businesses eliminate safety hazards and prevent accidents. Regulations also provide guidelines used by emergency personnel in handling emergencies. Departments in the local government and the ***Occupational Safety and Health Administration (OSHA)***, a federal agency, enforce these regulations. Agencies frequently inspect businesses to ensure that regulations are followed.

Employees of businesses can help maintain safety standards and increase personal safety in a variety of ways. Personal medical information that would be needed in a medical emergency should be reported to the appropriate person(s). For example, allergies to certain medicines should be recorded in each employee's work records. These records can assist health professionals in selecting medications for the victim of a medical emergency. In addition, safety rules and procedures should be observed. Hazards such as property damage and unsafe and insecure conditions should be observed and reported. Employers have the legal right to discipline employees who fail or refuse to follow safety rules. However, employers are not allowed to fire or discipline an employee for reporting a safety hazard.

It is important to know the location of emergency equipment and how to use it. Employees should be aware of emergency procedures and escape routes. Work clothes appropriate for each work situation should be worn. For some jobs, items such as scarves, neckties, loose pockets, long sleeves, dangling jewelry, wristwatches, rings, and tie aprons should be avoided. These can easily become caught on sharp corners or in machinery.

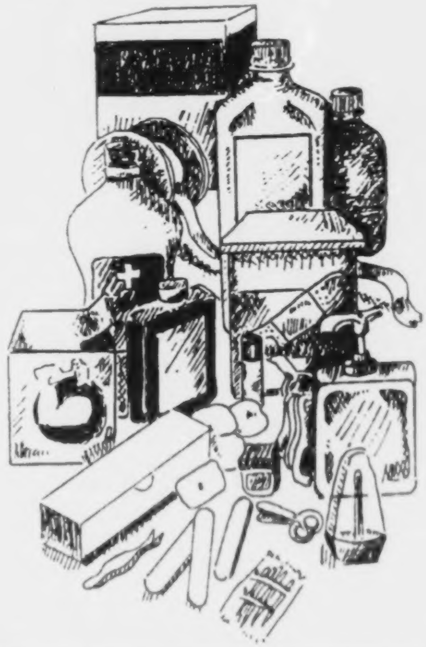
Shoes that are comfortable and give needed support should be worn.

Some businesses assign employees to serve on safety committees. The committees check various departments regularly to spot hazardous conditions and unsafe work habits. Employees should report all hazardous conditions to their supervisor(s) and/or engineering/maintenance department. Hazardous conditions should be corrected immediately. Common hazards include the following:

- broken equipment, lights, locks, electric outlet covers, and glass
- lights that are burned out
- water leaks
- frayed electrical cords
- poor sanitation practices
- slippery or dirty working conditions, working surfaces, and traffic areas
- damaged floors, furniture, walls, ceilings, handrails, doors, and windows
- fire hazards
- blocked or poorly-marked fire exits
- obstruction (objects or electrical cords) in traffic areas that could cause a person to stumble or trip
- flammable items near heat sources
- inaccessible, missing, or damaged fire extinguishers
- fire extinguishers that are improperly mounted or expired and in need of recharging
- unguarded wall and floor openings

Businesses are responsible for keeping and maintaining first-aid supplies for use in emergency situations. According to the American Red Cross, first aid is "the immediate and temporary care given to a person who has been injured or who has suddenly become ill." First-aid kits at businesses should be maintained in proper locations, easy to reach, and properly stocked. A business should stock only first-aid supplies and equipment that staff members are trained and authorized to use. The employee responsible for maintaining first-aid supplies and equipment should perform a regular inventory of supplies, be informed when supplies are used, and order replacement supplies immediately. Examples of first-aid supplies and equipment that may be useful for businesses include the following items:

- absorbent cotton
- assorted bandages
- sterile gauze bandages and pads (assorted sizes)
- adhesive tape (1/2 to 1 inch wide)
- bandage scissors
- tweezers
- sterilized needles (to remove splinters)
- thermometers
- syrup of ipecac (to induce vomiting)
- activated charcoal (to absorb poison)
- epsom salts (a strong laxative for use with poisonings)
- aromatic ammonia (for fainting)
- calamine lotion (for insect bites)
- rubbing alcohol
- baking soda
- hydrogen peroxide
- petroleum jelly
- tongue depressors
- splints
- measuring spoons
- safety pins



- paper or plastic drinking cups
- washcloths
- towels
- sanitary napkins (for dressing serious wounds)
- blankets
- liquid soap
- stretcher
- flashlight
- first-aid book
- water

For increased safety, many businesses require employees to receive first-aid training. Some businesses provide training for employees during work hours. It is important for employees to pay careful attention to basic first-aid procedures in order to save lives and increase safety.

Using Specialized Tools and Equipment

A variety of specialized tools and equipment are utilized in the textile and apparel industries. For example, employees in apparel services may use tools and equipment related to the cleaning, laundering, or alteration of apparel. Apparel production employees may operate equipment related to cutting, sewing, pressing, packing, or shipping products. It is very important that safe and effective practices always be followed when working with any tools and equipment.

The employer has the responsibility to provide adequate training and supervision for use of tools and equipment. Each employee should have knowledge and skills to operate tools and equipment safely and effectively for performing assigned tasks.

The employee is responsible for applying the knowledge and skills. The employee is also responsible for concentrating on the task at hand, avoiding distractions, and being in good shape to operate equipment safely. Accidents are caused when employees are careless or distracted. Accidents are also more likely when a person is tired or sick, and some medications cause drowsiness or inability to concentrate. If there is any reason that the employee cannot perform tasks safely and effectively, the supervisor should be notified.

◆ Essential Questions: ◆ Safety Responsibilities

1. What responsibilities do employers have to ensure safety in the workplace?
2. What responsibilities do employees have to ensure safety in the workplace?
3. What should an employee do when she or he feels unable to operate tools and equipment safely? Why?

GOVERNMENT REGULATIONS, CODES, AND STANDARDS

The ***Occupational Safety and Health Act of 1970*** requires employers to correct safety violations and to make the workplace free of any hazards that might cause injury or death to employees. OSHA enforces the act. OSHA standards that apply to the apparel and textile industries relate to the following areas:

- protective devices required for each point-of-operation (the part of a machine where work is performed)
- guarding for any mechanical power-transmission machines
- electrical grounding of hand tools and other equipment
- mechanical or electrical methods for stopping textile machines
- devices to prevent machines from restarting automatically after a power failure
- prohibition on splices in electrical cords

- starting and stopping controls that prevent a worker's hand or fingers from touching any part of a machine
- clean, obstruction-free aisles and work spaces
- maintenance of all guards, safety devices, and starting and stopping devices
- proper storage of flammables (such as solvents and spot-cleaning fluids)
- excessive noise levels and dust (such as cotton dust)
- hazardous materials and lasers (such as lasers used to cut garment pieces)
- personal protective occupational safety equipment
- proper types and amounts of lighting
- insulation on steam pipes
- safety valves on pressure-reducing valves used by laundries

OSHA regulations are listed in Title 29, section 1910 of the Code of Federal Regulations, published and updated regularly by the Office of the Federal Register, National Archives and Records Administration. The Code of Federal Regulations can be found in many libraries and Title 29 of the Code can be found at local OSHA offices.

Businesses are also encouraged by OSHA to keep records on all employment-related accidents and to establish safety programs. The safety programs may involve on-the-job safety training programs or organization of safety committees. OSHA also requires that accidents causing death or injury to five or more people must be reported to the Department of Labor.

Businesses must display OSHA posters listing employees' legal rights regarding safety. OSHA also requires that employees be informed about all chemicals they use on the job. OSHA will provide safety data sheets for each chemical product used at a work site. Employees are required to learn this information and become thoroughly informed about the products they use on the job.

OSHA compliance officers periodically inspect job sites and businesses to ensure that employees work in safe environments. The OSHA officer determines a business' compliance with OSHA requirements and identifies potential job hazards. Any violations or potential hazards an OSHA inspector believes might affect employee safety are recorded and brought to the management's attention. Management is required to correct the situation immediately or within a given time period. If a serious safety violation is identified, the job site may be closed until the problem is corrected. Businesses failing to comply with OSHA's violation notices are subject to civil and criminal penalties. Possible penalties include fines up to $1,000 for failure to correct a violation or prepare reports, up to $10,000 for each intentional or repeated violation, and imprisonment for up to six months for serious violations.

KEEP WORK AREAS CLEAN!

Businesses are also required to comply with worker's compensation laws. Federal and state ***worker's compensation laws*** include plans for worker's compensation insurance to pay employees or their dependents for physical disabilities, injuries, or deaths caused by employment. An employee may sometimes receive insurance benefits even if it is determined that he or she was careless. However, the employee determined to have been careless cannot sue the employer because of injuries. Employees are unable to make claims in certain situations. For example, employees who deliberately injure themselves to collect benefits and employees who are injured while intoxicated cannot file for worker's compensation benefits.

State and local building and safety codes include safety requirements related to fire prevention, structural safety, sizes and number of rooms allowed, exits, ventilation, refrigeration, heating, and sanitary equipment. Codes are enforced during construction, remodeling, use, and operation of a business. Failure to correct safety violations results in fines, loss of certificate of occupancy, or jail sentences. ***Certificates of occupancy*** are issued by building inspectors after approval of a building for business use. Code violations also are subject to lawsuits by customers if an injury occurs before the violation is corrected.

Building codes must be followed when buildings are built, rebuilt, or remodeled. The codes ensure the foundation is prepared properly and that it passes a stress test. The planned use for the building must be compatible with the structure in order to meet the building code standards.

Health inspections regularly conducted by the local health department may involve any kitchen or snack area located on business premises for compliance with environmental and sanitation standards. The fire department has codes that specify the maximum number of people allowed in public rooms, ratios of fire extinguishers to rooms, types of fire extinguishers required for specific areas, requirements that fire extinguishers are charged regularly before they expire, and operation of fire emergency systems.

In addition to required inspections, managers are responsible for having elevators, boilers, electrical systems, and equipment inspected regularly for maintenance and repairs. If these items are in need of repair, they can be hazardous to the safety of customers and employees.

◆ Essential Questions: ◆
Government Regulations, Codes, and Standards

1. What is the purpose of the Occupational Safety and Health Act of 1970?
2. What are three examples of OSHA safety standards that apply specifically to the textile and apparel industries?

ERGONOMICS AND THE WORK ENVIRONMENT

Workplace safety and health programs must consider the overall environment in which employees work. This includes such factors as air quality, potentially hazardous substances, and the way people physically perform their job functions.

Ergonomics

Ergonomics is the science of fitting the job to the worker. Ergonomics involves designing and arranging things people use so that people and things interact as safely and efficiently as possible.

A mismatch between physical requirements of a job and the physical capacity of a worker can lead to musculoskeletal disorders (MSDs). ***MSDs*** are injuries and disorders of

BE
CAREFUL
DON'T TRY TO
LIFT MORE THAN
YOU ARE ABLE

the muscles, nerves, tendons, ligaments, joints, cartilage, and spinal discs. They do not include injuries resulting from slips, trips, falls, or similar accidents. Examples of MSDs include carpal tunnel syndrome, tendinitis, sciatica, herniated disc, and low back pain.

Risk factors that can contribute to MSDs include force, repetition, awkward postures, static postures, vibration, or cold temperatures. For example, workers who must repeat the same motion throughout their workday, do their work in an awkward position, or repeatedly lift heavy objects run a greater risk of developing MSDs.

MSDs are often very easy to prevent. Adding a book under a monitor or padding a tool handle are typical of the fixes used in ergonomics programs. A company concerned about ergonomics will look for solutions that fit the work to the worker. Thousands of employers have already adopted such solutions. A government study found that employers' ergonomics programs effectively reduce injuries. Ergonomic suggestions recommended by OSHA include:

- Adjusting the height of working surfaces to reduce long reaches and awkward postures.
- Putting work supplies and equipment within comfortable reach.
- Providing the right tool for the job and the right tool handle for the worker.
- Varying tasks for workers (e.g., job rotation).
- Encouraging short authorized rest breaks.
- Reducing the weight and size of items workers must lift.
- Providing mechanical lifting equipment.
- Using telephone headsets.
- Providing ergonomic chairs or stools.
- Supplying anti-fatigue floor mats.

A good source of updated information on ergonomics is the OSHA Web site at *www.osha.gov*.

The Work Environment

The general work environment in a facility is important for safety and health. Air quality in offices is often poor. Chemicals used in office machines, in manufacturing plants, or elsewhere can pollute the air. Passive smoking is also hazardous to a person's health. Passive smoking is the process of inhaling smoke from other people's cigarettes, cigars, or pipes. Therefore, the office ventilation system must work properly, and managers should designate smoking areas that are isolated from the work spaces of nonsmokers. The shelf life and hazards information on all stored chemicals should be studied and carefully followed.

Automated equipment in offices, such as printers, speaker phones, and copiers, has resulted in increased noise levels. Very noisy offices can cause hypertension and even hearing loss. To reduce noise levels, quieter equipment can be purchased or sound-absorbent enclosures and materials can be used to block the noise. Loud equipment can be located away from workers who do not use it or who perform tasks requiring the most privacy. Workers should be trained in the proper use of office communications systems.

Essential Questions: Ergonomics and the Work Environment

1. What is ergonomics?
2. Why is it important that a job be fitted to the worker?
3. What are suggestions for implementing ergonomics programs?
4. What are examples of ways to improve the general work environment in a facility?

ACCIDENT PREVENTION AND PROCEDURES

Accidents in the workplace result in injuries and lost productivity. The majority of accidents can be prevented by paying attention to and correcting possible causes of accidents.

Major Causes of Accidents

Most accidents are the result of carelessness. Employees should be observant and cautious to prevent accidents while working. The most common accidents are falls, cuts, and burns.

Falls are usually caused by slippery or wet floors, objects in corridors or on stairs, electrical cords in traffic lanes, poor lighting, improper maintenance of floors, brooms and mops in traffic lanes, carelessness, unsteady or broken ladders, and over-reaching. Businesses can be held negligent for some of these causes of accidents such as slippery or wet floors and poor lighting.

People are particularly prone to fall on slick, wet, or greasy tile floors and stairways. Employees should mop up spills and remove greasy substances immediately. Management and employees are also required to make sure areas are well lighted, hand rails are securely in place and properly maintained, and obstructions are removed.

Causes of cuts include use of dull knives; improper use of cutting equipment; broken glass; rough or sharp edges on furniture, equipment, and doors; sharp objects in wastebaskets; improper storage of tools; and falling objects. A sewing machine operator might accidentally stab hands or fingers with a sewing machine needle. All equipment used in the design, production, and care of apparel must be used properly in order to prevent accidents.

THINK

CARELESSNESS IS DANGEROUS

Burns, shocks, and explosions result from various situations including the following:
- improperly grounded electrical equipment
- improper handling of electrical cords and appliances
- cleaning or repairing electrical equipment connected to an outlet
- operating electrical equipment in or near water
- handling electrical equipment with wet hands
- cleaning light fixtures or changing light bulbs while electricity is on
- touching hot surfaces, objects, or scalding liquids
- placing flammable materials near an open flame
- wearing loose-fitting garments near a flame
- disposing of smoking materials carelessly
- using the wrong fire extinguisher
- faulty electrical equipment
- careless lighting of gas stoves and heaters

A number of factors can cause bodily strains and bruises, such as lifting objects that are too heavy, improper carrying and lifting, an unsafe work environment, horseplay and practical jokes, and colliding with other people or objects. Fatigue can also be cited as a cause for accidents. Fatigue is weariness caused by exertion or stress.

Employees are trained to handle equipment in order to obtain the most efficient use of the equipment and to prevent accidents. Frequent accidents and injuries occur when employees do not use equipment properly. For example, an employee not using rubber gloves when working with harsh chemicals is likely to experience an injury.

Procedures for Accident Prevention

Most accidents can be prevented. One method of accident prevention is for employees to develop the daily habit of observing work surroundings for potential hazards. Another way to prevent accidents is for all employees to follow safety procedures. Employee efforts toward accident prevention decrease the chance of accidents occurring. Methods of accident prevention are included in table 4.1.

When a safety hazard is discovered, the employee should report it immediately to a department manager or supervisor and the engineering/maintenance department for repair. Potential hazards employees should observe include the following:

- poor lighting in hallways, stairways, walkways, steps, parking lots, and public areas
- exit doors and stairways that are locked or not clearly marked
- lack of directions to exits
- blocked walkways
- slippery or dirty conditions
- overgrown landscaped areas that obstruct walkways and block views
- loose railings and ceiling tiles
- unsanitary conditions
- frayed or worn electrical wires and appliances
- ice or snow on walkways
- poorly maintained or insecure handrails for walkways, steps, and stairways

Fire Emergency Procedures

Businesses and their employees must always be prepared for the possibility of a fire anywhere in the physical facility or exterior grounds. Every business should assign fire emergency duties and train employees to follow specific procedures in the event of a fire. Should a fire occur, managers and some employees may be assigned the following responsibilities:

- alerting employees of the fire
- directing people to fire exits and safety
- quickly double-checking rooms to be sure all people are evacuated and directed to exits and emergency gathering areas
- pulling out unconscious victims quickly, if possible
- shutting all doors and windows of each room
- reporting to emergency gathering points to be accounted for and for further instructions

Employees should know the locations of fire exits, fire extinguishers, and places to meet when evacuating. In an emergency, employees should stay calm, try to perform their emergency tasks efficiently and quickly, and report to emergency gathering points for roll call. When people panic or become confused, more injuries occur.

Businesses should include fire-related procedures in each employee's training and continue to reinforce training with drills. Regular fire drills prepare employees for emergencies. It is an employee's responsibility to know correct procedures if a fire emergency occurs. Several employees of each business may be trained to operate fire extinguishers and alarms and to perform ***cardiopulmonary resuscitation (CPR)***. CPR is a lifesaving method involving artificial respiration while attempting to restart the victim's heartbeat.

Fire emergency systems in buildings should be inspected regularly. These systems include smoke and heat detectors, fire alarms, sprinkler systems, fire hoses, fire dumps, and fire extinguishers. Fire exits should also be clearly marked, visible, unobstructed, and unlocked. Fire equipment sites should be clearly marked, visible, and unobstructed.

Engineering/maintenance departments serve as technical advisors during a fire. They are responsible for helping firefighters by providing information about the building structure and electrical systems. Firefighters need information on how electrical systems are connected and wired and where fire hoses, water hydrants, and electrical panels are located. Firefighters also need access to chaseways and all rooms. Engineering/maintenance staff have knowledge of all electrical, heating, air conditioning, and plumbing systems within the building.

Certain employees may be responsible for removing cash, business records, invoices, and inventory lists and photographs from the premises when evacuating for a fire or any other emergency. Business records may include checkbooks, payroll records, bookkeeping ledgers, and journals. These items should be kept in one fireproof place, if possible, for easy removal during an emergency.

Employees should reach emergency gathering points quickly so that they can be accounted for by managers. Employees may receive additional emergency-related duties when they reach these gathering points. Department managers should know exactly which employees are on duty so they can accurately account for all employees.

Fires may be reported by breaking the glass over fire alarm boxes and pulling the alarm or by calling the fire department and front office by telephone. Employees should know the location of all fire alarm boxes. The fire department also may be reached by calling the operator or the 911 service.

Emergency telephone numbers should be posted near all telephones and on the inside cover of telephone directories. When reporting a fire, provide the following information:

- the name of the person reporting the fire
- the business' name
- the address of the business
- the type of fire
- the size of the fire

Unless a fire is small and the employee is trained to use fire extinguishers, an employee should never try to extinguish a fire alone. Help should be obtained from a supervisor. Getting help provides more people to assist and warns other employees of the fire. Small fires can become uncontrollable, large fires quickly.

◆ Essential Questions: ◆ Accident Prevention and Procedures

1. What are the most common accidents? What are some common causes of these accidents?
2. How can an employee help to prevent accidents in the workplace?
3. How does fatigue contribute to accidents? What can be done to prevent fatigue?
4. What does an employee need to do in order to evacuate a building safely in the event of fire?
5. When should an employee try to extinguish a fire with a fire extinguisher? Why?

Accident Prevention

BURNS

- Wear close-fitting clothing when working around heating elements or open flames.
- Use thick, dry hot pads or mitts when handling hot containers.
- Keep flammable materials (such as fabrics, oils, and aerosol products) away from open flames.
- Get help to handle hot, heavy containers.
- Avoid overflowing containers with hot liquids.
- Do not reach into an oven; pull out the oven rack and then remove the container.
- Follow safety procedures when operating and caring for equipment that has parts which are hot.

FIRES

- Inspect fire systems two times a year. (Fire systems include smoke and heat detectors, fire alarms, fire extinguishers, fire hoses, fire panels, and sprinkler systems.)
- Keep fire extinguishers near cooking, trash, and electrical areas.
- Do not leave electrical heating appliances, such as irons, unattended.
- Do not allow unattended electrical heating appliances to touch nearby items when hot. Nearby items may burn, melt, or result in fire.
- Make sure burned out matches are not smoldering (burning or smoking without a flame) when thrown into trash cans.
- Extinguish smoldering items by wetting them with water.
- Never use water or flour to extinguish a grease fire.
- Never try to carry a pan with burning contents to another location.
- Store combustibles away from heat sources and in metal containers. Combustibles are materials that catch fire easily.

Table 4.1

Accident Prevention - Continued

GAS EXPLOSIONS

- Check to see that the pilot light is on before lighting a range, water heater, dryer, or other gas appliance.
- Turn on the exhaust fan before lighting a gas range or any other gas appliance.
- Strike the match before turning on the gas to light an appliance.
- Check to see if the pilot light is on if there is a smell of gas upon entering a room with a gas appliance.
- Open windows and report a possible leak to a gas company if pilot lights are on and there is still the smell of gas.
- Do not light matches, turn on electrical equipment or lights, or cause any spark or flame until the source of a gas odor has been determined and corrected.

ELECTRICAL SHOCK

- Be sure electrical cords are in good repair.
- Never pull on an electrical cord when disconnecting from wall outlet; grasp the plug.
- Unplug electrical equipment from the wall outlet first, then disconnect the cord from the equipment.
- Never handle electrical equipment while hands are wet or while standing in water.
- Wear rubber-soled leather shoes to prevent electrical shocks and to prevent burns from hot spills.
- Make sure an appliance is turned off before it is plugged into an electrical outlet.
- Unplug electrical equipment or outlets promptly.
- Do not use aluminum ladders around electrical sources.

BACK STRAIN

- Lift heavy objects by squatting to the level of the object with feet apart and knees bent. Move objects close to the body and raise up by straightening the knees gradually and keeping the back straight. Do not bend over to lift objects.
- Set objects down by reversing the lifting procedure. Keep the back straight and the object close to the body. Keeping feet apart and legs straight, begin lowering the object gradually by slowly bending the knees.
- Do not overload trays, carts, or arms.
- Balance the weight on trays carefully.
- Get help to lift and carry heavy objects.
- Store heavy items on lower shelves.

Table 4.1 - Continued

FALLS

- Keep floors clean, dry, and free from obstructions.
- Clean up spills or slippery areas from floors immediately.
- Walk, instead of run, through corridors.
- Wear low-heeled, closed-toed, comfortable work shoes with rubber soles.
- Keep work areas and walkways clear and neat.
- Use a sturdy stepladder for reaching objects on high levels; never use a chair.
- Avoid overreaching.
- Watch your path and be aware of upcoming changes or obstacles in the pathway, especially around corners and through doors.

FATIGUE

- Get plenty of rest each night.
- Eat a nutritious diet.
- Practice good posture.
- Take rest breaks.
- Use time and energy-saving work methods.
- Become organized.
- Develop and maintain a positive attitude toward work and life.
- Develop good relationships with co-workers.
- Leave personal problems at home.

CUTS

- Discard chipped or cracked glasses and dishes.
- Sweep up broken glass immediately.
- Pick up glass splinters with a damp paper towel.
- Do not pick up broken pieces of glass with your hands.
- Put broken glass in a separate trash container or wrap in newspaper before placing in a trash container.
- Discard open cans and their lids promptly.
- Smooth sharp edges with a file.
- Position the fingers away from the needle when operating a sewing machine.
- Avoid knife cuts as follows:
  - Keep knives sharp. Store them in a knife rack or in slots in a drawer.
  - Use the proper knife for the job.
  - Pick up a knife by the handle and always carry a knife with the point down and the cutting edge away from the body.
  - Make cutting motions away from the body and away from other workers.
  - Curl the fingers like a claw to keep them away from the knife's blade when holding an object that will be cut.
  - Store knives properly. Do not leave knives where they cannot be seen or where they do not belong.
  - Quickly move out of the way if a knife falls; do not try to catch it.

Table 4.1 - Continued

Chapter Highlights

- Both employers and employees are responsible for workplace safety.
- Each business should establish a safety program, purchase liability insurance, and purchase worker's compensation insurance for protection against accidents and injuries.
- The employer has the responsibility to provide adequate training and supervision for use of specialized tools and equipment. Each employee should have knowledge and skills to operate tools and equipment safely and effectively for performing assigned tasks.
- Employees should report safety hazards immediately.
- Businesses are responsible for keeping and maintaining first-aid supplies.
- Government regulations, codes, and standards exist to help businesses eliminate safety hazards and prevent accidents. OSHA encourages all businesses to establish safety programs and to keep records on all employment related accidents.
- OSHA compliance officers periodically inspect job sites and businesses to make sure work environments are safe. The officers determine businesses' compliance with OSHA requirements and any potential job hazards. Some businesses also sponsor employee safety committees that are responsible for checking various departments regularly to spot hazardous conditions and unsafe work habits.
- Ergonomics is the science of fitting the job to the worker. Ergonomics involves designing and arranging things people use so that people and things interact as safely and efficiently as possible.
- Most accidents result from carelessness. The most common accidents are falls, cuts, and burns.
- Most accidents can be prevented by observing potential safety hazards and following safety procedures.
- To prepare for fire emergencies, businesses should assign specific emergency responsibilities to employees, train employees to follow specific procedures in the event of a fire, and inspect fire emergency systems regularly.

Chapter 5

Organizational Goals, Policies, and Procedures

Chapter Focus

The following Essential Knowledge and Skills are discussed in this chapter:

1A Contrast the organizational structure of selected businesses in the textile and apparel industries.
1B Describe how goals, policies, and procedures influence business structures.
1C Relate the impact of organizational goals, policies, and procedures to each individual's job performance.
1D Explain the importance of scheduling in managing employee work assignments.
1E Analyze demographic, economic, and societal factors influencing organizational goals, policies, and procedures.
15B Exhibit ethical practices as defined by the textile and apparel industries.

Chapter Vocabulary

accountability
complaint
chain of command
closed shop
compensation
code of ethics
company protocol
dismissal or termination
ethics
goal
grievance
hierarchy
incentive
incident file
job description
labor union
management
mid-management level
minimum wage
mission statement
open shop
organizational chart
orientation
peak seasons
performance appraisal
policy
policy manual
procedures
resignation
salary plus commission
salary plus commission-over-quota
staff level
straight commission
straight salary
standard operating procedures (SOPs)

Each business has specific goals, policies, and procedures. A ***goal*** is something a person or organization works to attain. A ***policy*** is an overall plan that states the goals and operating procedures of an organization. Policies are made to ensure the smooth operation of the business. Policies also enhance the relationships between employees and management, and between staff members and the customers they serve. ***Procedures*** are step-by-step guidelines that help employees perform jobs efficiently with the same results each time. Procedural guidelines allow supervisors to fairly evaluate an employee's job performance.

ORGANIZATIONAL GOALS

It is important for employees to understand how businesses are structured. A business may have a very simple or a very complex structure. Most businesses have written goals and objectives. The underlying or main goal of a business is usually referred to as a mission statement. A ***mission statement*** is a broad statement that explains the purpose or direction of the company. All plans for the business are based on the broad mission statement. More specific goals are identified after the mission statement is written. Policies and procedures are selected that help the business achieve the identified goals.

A company's mission statement and other goals may be changed as conditions change or as the business grows. A company's mission statement should be developed by considering the following elements:

- the company's history
- current preferences of the management and owners
- environmental factors
- available resources
- competencies and abilities of the company

Most successful companies develop a mission statement and other goals by focusing on the customer rather than on the goods or services produced by the company. Products and services change while customer needs last.

Impact of Societal Patterns on Organizational Goals

The societal environment of an organization includes the general forces that may not directly touch the daily activities of the organization, but often influence its long-run decisions. These forces include political and legal forces, sociocultural forces, economic forces, and technological forces. A business must assess these forces to determine how they will impact the ability of the organization to meet its organizational goals. Specific questions that should be asked regarding these issues include the following:

1. What is the regulatory environment, and what effect do government regulations have on the business?
2. What are the community demographics and populations trends, and what are the skill levels of the individuals in the community?
3. What cultural issues will impact business decisions or employee behavior?
4. What are the availability of transportation systems, banking facilities, professional services, economic base, and a good school system to accommodate the business?

The organization must be prepared to look beyond traditional business at the big picture based on its relationship to the society in which it functions.

◆ **Essential Questions: Organizational Goals** ◆

1. Why is a mission statement important to an organization?
2. What elements should be considered in developing or revising a mission statement?
3. What are examples of societal forces that impact organizational goals? Why are these forces important to the big picture of organizational success?

ORGANIZATIONAL POLICIES

Each business sets its own policies based on the philosophy of the owner/management, type of business, mission statement, and other factors. All organizations have a chain of command or hierarchy. A ***chain of command***, or ***hierarchy***, is a structure of ranks within an organization according to the amount of authority each possesses. An ***organizational chart*** illustrates the chain of command for a company. Figure 5.1 is an example of an organizational chart for an apparel retail business. The organizational chart helps employees understand how the organization should function. It also helps employees see how departments are related to each other. The organizational chart illustrates the proper channels for transferring information, initiating complaints, and submitting reports. It shows the lines of authority and allows employees to understand the possibilities of advancing in the organization.

The expected order of conducting communications between departments is often referred to as ***company protocol*** or using the proper channels. In large businesses, the chain of command may be provided in written form to employees. In smaller organizations, the chain of command may not be written. In this situation, employees must become familiar with the chain of command for the company over a period of time. It is important for new employees to listen carefully and ask appropriate questions in order to understand the operating structure of a business.

Management is the executive level of an organization where decisions are made and policies are set. At the ***mid-management level*** or supervisory level, policies are interpreted and procedures are outlined. At the ***staff level***, procedures are carried out. Each level is responsible to the next level and is dependent upon the next level to be able to function effectively.

Each employee is accountable to a supervisor. ***Accountability*** involves answering to someone for work done. The success of a company depends on employees, supervisors, and employers sharing responsibilities fairly. Supervision is an essential part of seeing that all parts of the business are fulfilling assigned responsibilities.

Various job titles are given to persons employed in the textile and apparel industries. As noted previously, each business may assign different job titles to people who perform essentially the same tasks. Job titles in the textile and apparel industries change over time just as job titles change in other industries. Becoming familiar with assigned responsibilities and the organizational structure of a business helps an employee understand what job titles mean.

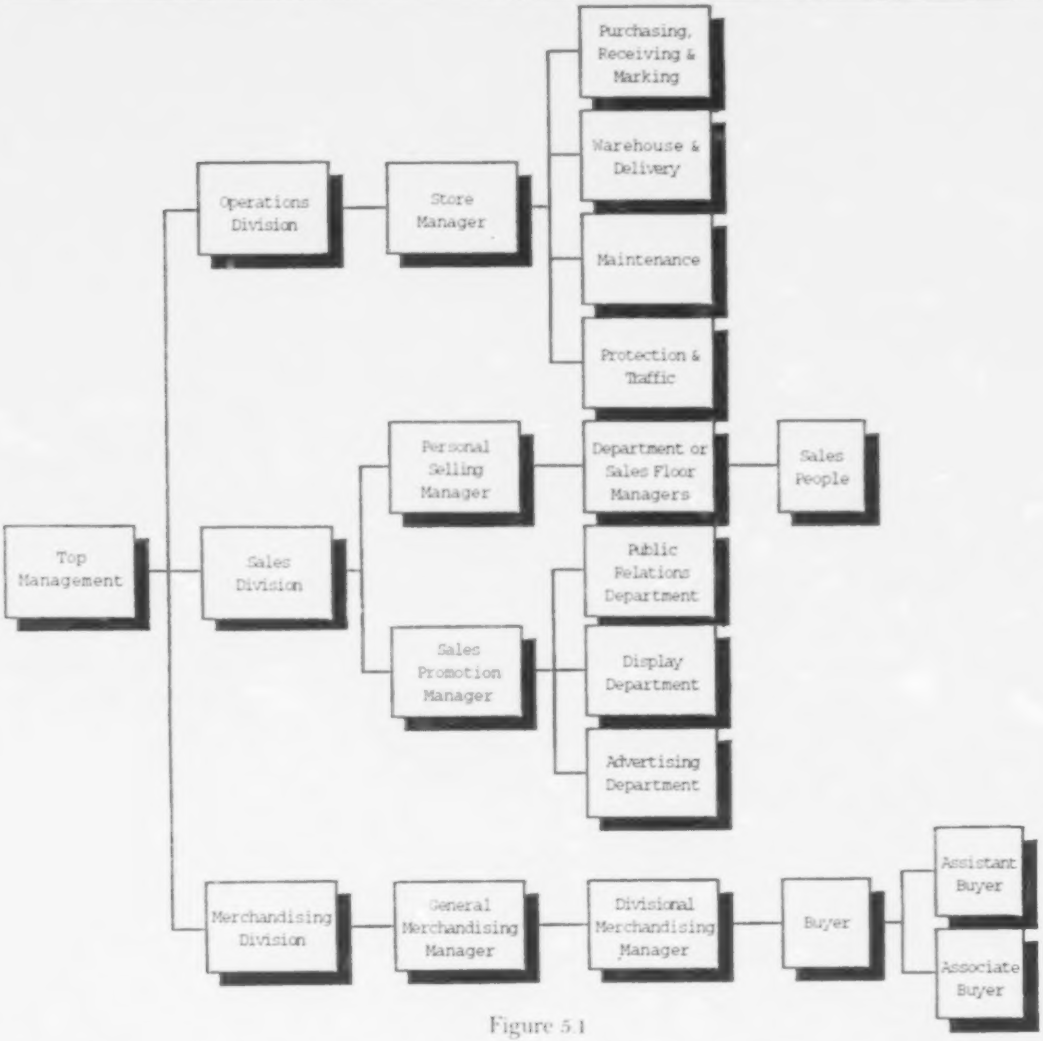


Figure 5.1

Ethics

Ethics are the principles and standards of conduct that govern a profession, business, or group of people. Many professional groups or businesses have a ***code of ethics***, a written set of standards that define ethical practices within the industry. As a member of the group, a person is asked to follow the standards of the organization.

Employees in the textile and apparel industries are engaged in a variety of tasks that require ethical behavior. In any job, there are many opportunities for an employee to choose between ethical and unethical behavior. For example, salespeople are often responsible for large sums of money. Handling the employer's money in a responsible manner and ensuring that the standards of the business are followed shows ethical behavior. When a company sets and enforces policies, employees find it easier to make ethical decisions.

Honesty, moral integrity, and reliability are traits that employers and customers expect from employees. The personal actions of employees affect the reputation of the business and its relationship with customers. In addition, each employee's personal actions affect relationships with co-workers. Management should serve as a role model for employees in providing an example of ethical behavior. If a supervisor is involved in unethical business practices, he or she sends a message to employees that unethical behavior is acceptable or will be overlooked. By setting positive ethical examples, by carefully screening employees for ethical practices, and by taking prompt action when unethical behavior occurs, management can develop a strong ethical team.

Employee Orientation

Orientation is a process used to help new employees become familiar with a business. During orientation, an overall summary of the business is presented. Company officials may meet with each group of new employees to welcome them and to explain certain policies. Sometimes, a tour of the facilities is conducted. A company's orientation process may last from a few hours to several days, depending on company policies.

The ***policy manual*** or ***employee handbook*** is a book that outlines company rules and lists information regarding insurance, sick leave, vacation, and other benefits. This information is usually explained to new employees during orientation. A copy of the book is usually provided to each new employee.

Probation Periods

A probation period is a period of time during the beginning of employment when the new employee is trained to meet the standards set for his or her job. An employee who meets the standards by a set period of time, usually thirty to ninety days, is allowed to continue employment. The probation period allows for both the employer and employee to evaluate each other and the job situation. The supervisor determines if the employee shows initiative, accepts responsibility, performs the job as required, and gets along well with others. The employee determines if he or she likes doing the type of work assigned, can meet the production schedule, is being paid adequately for the work required, has opportunity to learn new skills, and can advance to other positions.

Attendance

Good attendance is an important job requirement in any organization. Every employee is expected to report for work regularly and on time. Failure to come to work and chronic tardiness are unfair to other employees who must adjust work assignments to see that the absent or tardy employee's work is done. Such situations result in resentment among employees and slow down work production. Promotions and future employment recommendations are impacted by attendance and punctuality.

When an employee must be late to work or cannot attend because of illness or an emergency, he or she should call a supervisor as soon as possible. This helps supervisors arrange for replacements and adjustments to be made and avoids various problems. Employee handbooks usually identify whom to call prior to necessary absence or lateness and what procedures are to be followed when the employee returns to work. Most companies require that forms be completed to record an absence or to apply for sick leave or vacation leave. Some companies require that an employee who is absent because of illness submit a written doctor's excuse that verifies the illness. Absenteeism or continual tardiness is a serious concern of management and may result in disciplinary action.

Performance Appraisals

A ***performance appraisal*** is a process used to evaluate an employee. A supervisor uses a performance appraisal instrument or checklist to perform the employee evaluation. Performance appraisals are performed by supervisors at certain times throughout employment including the probation period. Evaluations allow the employee and the supervisor to evaluate performance and to set new goals. Employees should view appraisals as an important step in achieving new goals and working toward advancement.

Evaluations are management tools used to ensure that productivity is kept at a high level. The items evaluated usually relate to the policies and procedures of the company and employee characteristics such as initiative, leadership, cooperativeness, attitude, reliability, punctuality, personal habits, and dress. Each item on the appraisal should be clearly explained to the employee.

At a performance appraisal interview, the supervisor and employee should review the employee's job description. A ***job description*** is a written summary of a specific position including the major responsibilities of the job and the experience and education necessary for the position. A job description may also include items such as any unique aspects of the position, the reporting process, and the place of the position in the overall structure of the organization.

Some companies maintain an incident file for each employee. An ***incident file*** is used to collect information that establishes and verifies the employee's job performance. Each item placed in the file should be discussed with the employee. An employee's incident file should be kept confidential and should be available for the employee to view at his or her request. Incident files are often used by supervisors in completing employees' performance appraisals.

Disciplinary Action

An employee's failure to observe company rules can result in disciplinary action. Such action can involve a private discussion with the supervisor, a written notice of misconduct, a suspension or probationary period, or a termination. The disciplinary action process involves a series of steps. The first step is usually a verbal warning that may be given by the supervisor in the employee's work area or in the supervisor's office. This informal talk is used to establish an understanding of the supervisor's expectations.

If an employee fails to perform work or displays conduct that is not appropriate for the standards of the business, the next step may be to hold a conference with the employee. The conference helps determine if the employee understands the rules involved or the standards of work expected. The employee may be asked to sign a record stating that he or she understands what is expected and has been advised of the next step if improvement does not occur.

If the employee's performance or behavior does not improve, a written notice of disciplinary action may be prepared. A written notice may be presented to the employee in the supervisor's office. The letter to the employee details how performance or conduct has failed to meet the company's standards. The letter also states how work performance can be changed to meet acceptable standards. The employee is asked to read the dated notice and to sign it. Signing the notice means that the employee has received and understands the notice. A written notice of disciplinary action is placed in the employee's file after the conference is held.

The next infraction of a rule by an employee or refusal of the employee to correct his or her actions may lead to immediate dismissal, suspension from work without pay, or a probationary period. Being dismissed or fired not only results in economic consequences for the employee, but may also make it difficult for the employee to secure another job.

Unless a work situation is life-threatening, could lead to injury, or is immoral, the employee has the responsibility to follow policies of the business. Any disagreements with the company policies and rules should be discussed with a supervisor. If an employee feels that he or she cannot follow the company's rules, it is better to resign than to be dismissed.

Dismissal

Dismissal or ***termination*** is removal of an employee from a job because of misconduct, insubordination, poor work performance, or other good cause. Dismissal may follow the disciplinary process because of the employee's failure to correct poor work performance or misconduct.

Misconduct may be a reason for immediate dismissal without the usual review process. The following examples of misconduct might result in immediate dismissal:

- unauthorized use of records or identification material
- theft or misuse of company property
- intentional furnishing of false information (such as on a job application)
- use of force or violence
- physical abuse of any person on company property
- unauthorized entry or use of facilities
- use, possession, or distribution of drugs, alcoholic beverages, or any substance that is regulated by federal or state law
- indecent or obscene conduct on company property or at a sponsored or supervised function
- failure to comply with the lawful direction of the management where such directions are issued in the performance of job duties
- engaging in a second business or profession during company working hours
- disclosing confidential information acquired by reason of the position

Sometimes companies must terminate employment for some individuals because of lack of funding or lack of work. When such situations occur, the terminations may be referred to as laying off employees. Most businesses try to move productive employees into other positions rather than terminate employment when such problems occur, although sometimes layoffs are unavoidable.

Resignation

Resignation is the voluntary relinquishing of a position by an employee. Resignation from a job involves following certain procedures. A company may have a form that an employee completes to notify the employer of resignation. In most cases, the employer will accept a written letter from the employee notifying of plans to resign. Small businesses may accept a verbal resignation.

An employee may resign for a variety of reasons. For example, the employee may move to another location, have an opportunity for another job, be unhappy with the present job, or return to school. The length of time an employee must work following the notice of resignation depends on company policies. A general guideline is that an employee should expect to work at least one pay period following the notice. Therefore, the employee would work one week if paid weekly, two weeks if paid semi-monthly, or one month if paid monthly. Various circumstances may require that other arrangements be made. For example, if a person learns that his or her family must move in two weeks, there may be no choice about how long the person can work after resignation. The employee should discuss the situation with the supervisor. An employer is more likely to provide good references if an employee shows responsible behavior by following proper procedures when resigning from a job.

Vacations and Sick Leave

Most businesses offer employees benefits such as specific amounts of time for use as sick leave and vacation leave. Vacation leave, or annual leave, and sick leave are called employee benefits because the employee usually continues to receive pay during the vacation period or time of illness. Some companies encourage their employees to take vacation leave at certain times during the year when they are less busy. For example, some manufacturing plants close for complete maintenance and repairs of equipment at certain times during the year.

Employees usually have to request permission to schedule vacation time. Employees who have been employed the longest may be given the first choices for vacation leave. A new employee may be required to work a certain period of time, such as six months or a year, before vacation leave can be taken.

The amount of vacation leave and sick leave allowed each employee varies from company to company. In some businesses, each employee accrues (earns) a certain number of hours of annual leave and sick leave for each month of employment. In other companies, each employee is assigned a specific number of days per year that can be used as sick leave and annual leave. Some companies require employees to use all leave by a certain date during the year. Other companies allow employees to collect sick leave over a period of time without losing it if carried over from one year to the next.

It is important that employees use sick leave wisely. Sick leave should be used only for medical reasons. Depending on company policy, the employee may have to provide the personnel office with a written statement from a doctor verifying why sick leave is taken.

Uniforms and Dress Codes

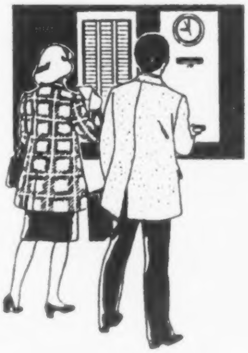
Each business may establish a dress code and grooming requirements for its employees. Such requirements are set in order to serve the needs of the business and its staff. A company's dress code may be specific or unstructured. Usually, a dress code is related to the types of clothing that are acceptable for employees while they are at work. General grooming requirements may also be identified for employees. Dress codes and grooming requirements help employees project the positive image that a business desires.

Some jobs require employees to wear uniforms. Uniforms help identify employees of a firm and encourage a clean, neat appearance. Some businesses provide uniforms at no cost to employees or provide discounts on the purchase price of uniforms. If employees must buy their own uniforms, they should keep records of the purchases for use in figuring federal income tax deductions.

If uniforms are not required, it is important for each employee to wear clothing appropriate for the assigned job responsibilities. It is also very important for each employee to consistently use good grooming habits. Being clean and neatly groomed is the factor that can project a good image to the public. A pleasant appearance shows that the employee cares about himself or herself and about the business.

Use of Time Clocks

Most businesses pay some employees based on the number of hours they work. In order to accurately calculate hours worked, each employee paid by the hour is required to use a time clock to record exactly when he or she arrives at work and leaves work. A time clock is usually placed near the employee entrance to a business. The employee inserts a time card provided by the employer in the time clock upon arrival and departure each day. The time clock stamps the time on the card, thus recording work hours. In some businesses, all employees are required to use a time clock whether they are paid hourly wages or not.



Identification Badges

Some businesses provide identification badges for all employees to wear. Each badge usually shows the employee's name and title or department. Wearing an identification badge helps customers know that the person is an employee of the company. Identification badges can also help make the contact between an employee and a customer more personal since the badge helps the customer remember the employee's name.

Security in large businesses with many employees and large numbers of customers is a major concern of management. Identification of employees with badges is sometimes done to help with security. The background color of badges or identifying symbols on the badges allows employees and security personnel to determine if employees are in appropriate areas. Background colors of badges may also indicate time periods and may be issued each year.

Work-Related Injuries

Any injury received while on the job should be reported immediately to a supervisor. If medical attention is required, prompt reporting ensures that the employee will get the help needed. The supervisor is responsible for reporting the employee injury to management. Information must be given about the cause of the injury, the required medical treatment, and the amount of work time lost as a result of the injury. Witnesses to the injury must be named for worker's compensation reports.

When an employee cannot work as the result of a work-related injury, he or she may be eligible for worker's compensation benefits. As described in Chapter Four, worker's compensation is an insurance policy provided by most employers to insure the company against liability involving injuries received by employees while working. If an employer has this type of insurance, the injured employee can receive medical treatment and a portion of the wages that he or she would normally have been able to earn.

Complaints and Grievances

A **complaint**, or **grievance**, is an employee's formal expression of disagreement that may be related to a variety of situations. An employee may choose to submit a formal complaint about issues such as work hours, working conditions, performance appraisals, merit raises, interpretation of the official personnel or administrative policies, oral or written reprimands, or job assignments. The employee should first discuss any problem with an immediate supervisor. If no solution is reached, the employee may submit a written complaint to the second level supervisor for further consideration.

Employees should follow company policies when submitting formal complaints or grievances. Formal complaints and grievances should only be submitted if the employee has a serious and legitimate disagreement with a work situation. Employees who constantly complain contribute to a negative work environment. Remember that no work situation is perfect and that calmly discussing complaints with a supervisor usually solves problems. Avoid gossiping with other employees about complaints and grievances. Using the company guidelines for grievances or complaints is the best method for correcting problems.

Labor Unions

In the textile and apparel industries, some workers are members of labor unions. A **labor union** is a group of employees who join together to have a stronger voice with management. A representative elected by the union membership works with management to negotiate better working conditions, more competitive salaries, increased benefits, and fair treatment of workers. The union representative may also discuss complaints or grievances with management representatives. Membership requirements for a labor union are determined by the state in which the union operates and by company policies. Union members agree to follow union rules and procedures. Dues are required and can be expensive. If membership in a union is required, the company is known as a **closed shop**. If membership is optional, the company is known as an **open shop**.

◆ Essential Questions: Organizational Policies ◆

1. Why is it important for an employee to use the appropriate chain of command when communicating about company business?
2. What are the three levels that may be found in a business organization? What happens at each level?
3. In what types of situations would it be especially important for textile and apparel employees to exhibit ethical practices?
4. Why is consistent attendance an important job requirement in any organization?
5. What actions may result if an employee fails to perform work or displays inappropriate conduct?
6. What steps might an employee appropriately take to express a complaint to his or her employer?

ORGANIZATIONAL PROCEDURES

Every business establishes certain procedures to be followed by employees. Some procedures involve tasks that are done frequently. Other procedures should be followed in special circumstances. Specific standards are set for employees' job performance. Work schedules are also established by management and are followed by employees.

Standard Operating Procedures

Standard operating procedures (SOPs) are written procedures for those tasks that are done on a regular basis. They serve as operating guidelines for a business. SOPs are commonly used for daily routines, lost-and-found policies, time card procedures, inspection checklists, key control, performance appraisals, and inventory control. SOPs ensure that tasks are performed the same way by all employees each time the task is required. A standardized result improves the image of a business with customers and makes the operations of the business more efficient.

SOPs standardize routines so that all employees know what is expected of them in each situation. The use of SOPs ensures that the task will be completed in the same way each time it is done regardless of which employee is doing it. SOPs outline responsibilities and duties in the order they are to be done during a shift. Sometimes, the times that tasks should be performed are also identified. SOPs usually contain a general statement followed by procedures and methods of recordkeeping. The SOP often states penalties for not following the proper procedures.

A procedure manual is often provided to employees to help them perform their assigned tasks. This document explains exactly how to perform each step of a particular job. The manual is written in language that can be clearly understood, is listed in logical order, and includes photos or drawings where appropriate to help clarify instructions.

The new employee should carefully read the procedure manual, learn the procedures that apply to the assigned job, and write questions to be discussed with the supervisor. It is better to ask questions and be informed than to be uninformed and make mistakes on the job.

A procedure manual describes how a job is currently done. Such instructions should not be considered final. New supplies, equipment, and techniques are often introduced. Employees frequently suggest better and more efficient ways to perform certain aspects of their jobs. Changes in administrative policy, physical property, numbers of employees, and other factors can result in changes in basic procedures used by a business.

Many businesses encourage employees to find better ways to perform tasks. Incentive awards may be given to employees who improve operating procedures. An improved procedure is implemented by teaching current employees the technique involved, adding the procedure to the procedure manual, and training new employees in the procedure. While SOPs are not the only right ways to perform tasks, a new employee should learn and follow current procedures. As experience is gained, the employee can make recommendations for more efficient operations.

Job Performance Standards

Job performance standards are included in some procedure manuals. Job performance standards are statements of conditions that will exist when a job is performed satisfactorily. These standards are stated in precise terms clearly defining the areas, quantity, quality, and time of work. Standards should be written so they can be measured.

Performance standards are often developed by the supervisor and employee. They are used to describe the results the supervisor wants to achieve. Standards prevent the employee from having to guess what type of performance the supervisor expects. Knowing how to perform helps the employee prepare for regular performance appraisals by the supervisor.

Work Schedules

Office buildings, some manufacturing plants, and some retail stores close on weekends and holidays. Other businesses are open during weekends and holidays. There are ***peak seasons***, times when more work is required, depending on the type of business. For example, retail stores are very busy just prior to the Christmas holidays when gifts are purchased by many people. An apparel manufacturing plant may be busiest just before a shipment of clothing to a retailer. Management must schedule enough workers for the hours the business is open and for the projected business that will occur during those hours. During peak seasons, management may require or offer employees the option to work overtime, extra hours in addition to regularly scheduled hours.

Most businesses have regularly scheduled work shifts. Some businesses use rotation schedules. A rotation schedule ensures that a business has a full staff every work day, that no employee will work more than five days in any work week, and that weekend assignments are equally shared.

Shifts. Work hours vary greatly among the various types of businesses in the textile and apparel industries. Some businesses schedule employees in shifts. Scheduling employees by shifts involves having one group of employees for each of several time periods during which a business operates. For example, a retail store may schedule one group of employees to work during the morning and early afternoon hours and another group of employees to work during the late afternoon and evening hours. Manufacturing plants often have workers who deliver shipments of merchandise during the early morning hours in order to avoid heavy traffic in large cities. Therefore, workers must be scheduled to work at various times of the day and night.

◆ Essential Questions: Organizational Procedures ◆

1. What are standard operating procedures? Why are they used?
2. How are employee work schedules planned by management?

COMPENSATION OF EMPLOYEES

Compensation is payment for work done. Employees are paid using different compensation plans. Each business has policies regarding how employees are paid for the work they do. In most cases, a business will use different payment plans for different types of employees. For example, employees whose primary responsibility is sales may be paid on some type of commission compensation plan. An employee whose primary assignment involves administrative tasks is more likely to be paid on a straight salary compensation plan.

Minimum Wage

A minimum wage was first established in 1938. The original federal law called for a minimum wage of twenty-five cents per hour. Since 1938, the minimum wage has increased steadily and is projected to continue to increase. ***Minimum wage*** is the lowest amount of money an employee can be paid per hour and is set by law. As the minimum wage increases, the cost of operating a business increases in a variety of ways. Besides the increase in compensating minimum wage employees for their work, other employees usually expect a wage increase when the minimum wage increases. Most entry-level employees are hired at minimum wage. As experience is gained, hourly salaries may increase to amounts above the minimum wage rate.

Incentives

An ***incentive*** is a reward that acts as a motivation for an employee to be as productive as possible. Incentives are not offered to employees in all businesses. Incentives tend to tie performance to personal initiative. The following types of rewards are sometimes used as incentives to compensate employees:

- contests such as employee of the month programs
- bonuses in cash, services, or goods
- vacation time in addition to regular annual leave
- dollar commission on sales

In recent years, many employers have decreased the use of incentives. However, some large businesses, such as image consulting and cosmetic companies, are based on a philosophy of providing incentives to employees. These companies may offer a variety of incentives ranging from cosmetics to cars for employees who perform well.

Compensation Plans

Straight Commission. The straight commission compensation plan is primarily used to pay salespeople. A ***straight commission*** compensation plan pays an employee a specific percentage of the total volume sold. For example, an apparel salesperson might sell $10,000.00 worth of merchandise in one month. If paid on a straight commission basis of 8 percent of volume, the person would earn $800.00 during the month. This form of compensation is decreasing in use for two reasons. First, it tends to result in salespeople being overly aggressive in trying to sell merchandise to customers. In addition, it offers the employee little security since one is never certain how much money will be earned during each pay period.

Salary Plus Commission. The ***salary plus commission*** method of compensation includes a set salary plus a percent of each sale as an incentive. Salary plus commission is very common in department and specialty store retailing, as well as non-store retailing. It offers an employee a minimum level of security in a job. It also creates an incentive for the salesperson by tying performance to the paycheck. This payment plan is also used by many apparel manufacturers to pay people who work in production. Sewing machine operators may be paid a base salary and additional money based on the amount of work they produce. The salary plus commission plan encourages growth and rewards extra effort. In addition, the plan provides a certain amount of financial security that can encourage employee loyalty to the company.

Salary Plus Commission-Over-Quota. The ***salary plus commission-over-quota*** compensation plan is a variation of the salary plus commission plan. This plan pays an employee a set salary. In addition, the employee receives a percentage of sales over a certain quota. The employee does not receive a bonus until a certain amount of work is produced. This compensation plan gives the employee a sales goal and gives the employer the security that certain amounts of merchandise will be sold before incentives are paid. Figure 5.2 provides an example of salary earnings from a salary plus commission-over-quota compensation plan.

Straight Salary. A ***straight salary*** compensation plan offers each employee a specified amount of money for a specific number of hours worked. The straight salary plan offers less incentive to employees than some other compensation plans. Some employers feel that this plan does not motivate employees to perform well. However, in most businesses, some employees are paid by the straight salary compensation plan.

◆ ***Essential Questions:*** ◆

Compensation of Employees

1. What is the purpose of an incentive? What are examples of incentives that may be offered to employees?
2. Through what different methods might an employee be compensated?

Lonny, an accessories salesperson, receives $300.00 per week base salary with a weekly sales quota of $400.00 in merchandise. He receives 10 percent of all sales over the $400.00 quota. Lonny sold $900.00 worth of accessories in one week. The $900.00 total sales minus the $400.00 quota equals $500.00. The $500.00 over the quota is multiplied by 10 percent to get $50.00 (Lonny's commission-over-quota). Lonny's base salary ($300.00) plus commission-over-quota ($50.00) equals Lonny's total earnings of $350.00 for the week.

Figure 5.2

Chapter Highlights

- Each business is structured on the basis of organizational goals, policies, and procedures. A mission statement is a broad statement of purpose. Other more specific goals are based on the mission statement.

- A chain of command is a structure of ranks within an organization and is often illustrated through use of organizational charts. It is important for employees to follow the company protocol and communicate through proper channels.

- Different levels exist in a business including management (the executive level), mid-management (supervisory level), and the staff level. Each employee is accountable to a supervisor.

- Orientation is a process used to help new employees become familiar with a business.

- Various policies exist in different businesses depending on the company's mission and management. Company policies may relate to the following areas:

  -ethics
  -probation periods
  -attendance
  -performance appraisals
  -disciplinary action
  -dismissal
  -resignation
  -vacation and sick leave
  -uniforms and dress codes
  -use of time clocks
  -identification badges
  -work-related injuries
  -complaints and grievances
  -labor unions

- Standard operating procedures (SOPs) are written procedures for the tasks that are done on a regular basis. SOPs standardize routines so that all employees know what is expected of them. Procedure manuals are often used to describe how a job is currently done.

(Continued on page 76)

Chapter Highlights

(Continued from page 75)

- Job performance standards are statements of conditions that will exist when a job is performed satisfactorily. These standards are often included in procedures manuals.
- Work schedules are used by management to ensure that there are enough employees scheduled for the hours a business operates. Workers are sometimes assigned schedules according to shifts.
- Compensation is payment for work done. Methods of compensation include minimum wage, straight salary, and incentives.

Chapter 6

Textiles & Apparel: Terminology, Use, and Care

Chapter Focus

The following Essential Knowledge and Skills are discussed in this chapter:

3A Identify origins, properties, and qualities of natural and manufactured fibers.
3B Describe methods of fiber and yarn production.
3C Analyze the impact of technology on production of fibers, yarns, and fabrics.
3D Outline the textile design process from concept to finished product.
3E Differentiate types and methods of textile fabrication.
3F Summarize implications and methods of dyeing, printing, and finishing of textiles.
3H Determine factors affecting the cost of textile products.
5C Determine uses of technology in apparel design and production.
7A Define terms commonly used in commercial textile and apparel care.
12G Apply correct textile and apparel terminology.

Chapter Vocabulary

bleaching
bonding
carding
cleaning
cloth
colorfastness
color sealed
crabbing
denier
designs
dyeing
embossing
fabric
fashion
fashion cycle
felting
filament fiber
fleece
generic name
hackling or combing
knitted fabrics
line
mercerizing
napping
off-grain
on-grain
polymers
ply
printing
singeing
sizing
shearing
spinneret
staple
style
tentering
tow
trademark
Wool Products Labeling Act
woolen yarns
worsted yarns
woven fabrics
yarn

Read chapter sections for additional terms related to specific types of animal fibers, vegetable fibers, and manufactured fibers.

As defined in Chapter One, the word *textiles* is used to describe materials such as fibers and yarns that are used to make fabric. Cloth constructed from these materials may also be called textiles. ***Fabric*** is defined as cloth made from any textile fiber by a construction method such as weaving or knitting. ***Cloth*** is a generic term for all textile fabrics. These definitions illustrate that the terms textile, fabric, and cloth are closely related in meaning. Therefore, these three terms are used interchangeably throughout this reference book.

Becoming familiar with the most commonly used fabrics provides a basic understanding of both textile characteristics and of the procedures for handling various fabrics. In order to describe the qualities or characteristics of textile products or answer customers' questions, it is necessary to understand basic manufacturing procedures. Both natural and manufactured fibers are used to make textile products. In recent years, technological advances have allowed new fibers to be manufactured for use in making textile and apparel products. As a result, new and improved products are now available to consumers.

NATURAL FIBERS

Fibers that grow in nature are called natural fibers. Each natural fiber can be classified as either an animal or vegetable fiber. Cotton, wool, silk, and linen are the most commonly used natural fibers. However, a number of other natural fibers exist that are used in various textile products.

Animal Fibers

Wool. The animal fibers that are used most often to produce fabric are wool and silk. ***Wool*** is the protective covering of the sheep and is sheared from the animal for processing. Wool-bearing sheep are raised in almost every country of the world. Australia, New Zealand, South Africa, and China are the major wool-producing countries. Other countries, including the United States, also produce a considerable amount of wool. Wool produced in the United States comes mostly from Texas, California, and Wyoming.

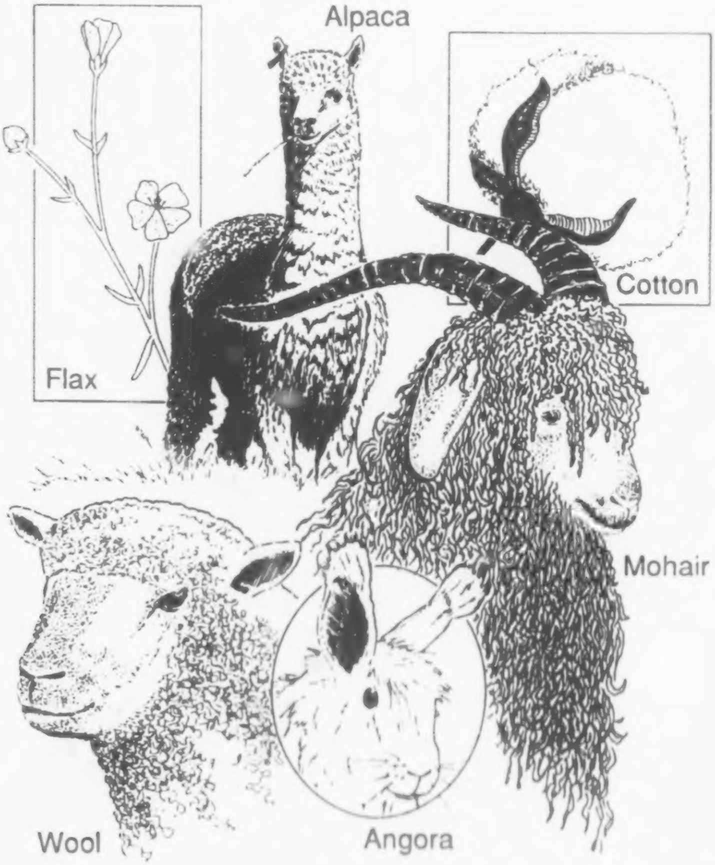
The sheep's covering that is sheared to make wool is known as ***fleece***. After sheep are sheared, raw wool is put through a ***carding*** process, a procedure that separates short fibers from long ones. Long wool fibers are spun using a special process to make smooth, compact ***worsted yarns*** used for fabrics such as gabardine and crepe. Short wool fibers are used to produce soft, dense ***woolen yarns*** used to make textured tweed fabrics. Wool is often blended with less expensive fibers to reduce the cost of the fabric or to extend its use.

Congress passed the ***Wool Products Labeling Act*** in 1939 to protect consumers, producers, manufacturers, and distributors. This act requires that all wool products be labeled and that labels identify the fiber content in terms of percentage the source(s) of the wool fiber(s). The Federal Trade Commission defines the terms that appear on the label of a wool garment according to the following guidelines:

- ***wool*** - the fiber from the fleece of the sheep or lamb or hair of the Angora or Cashmere goat (and may include the specialty fibers from the hair of the camel, alpaca, llama, and vicuña) that has never been reclaimed from any woven or felted wool product
- ***virgin wool*** or ***new wool*** - wool that has never been used or reclaimed from any spun, woven, knitted, felted, bonded, or similarly manufactured product
- ***recycled wool*** - fiber made from previously produced wool fabric that may or may not have been used by the ultimate consumer; through a reprocessing procedure, the wool fabric is returned to a fibrous state for use in making other textile products

Recycled wools are often made from the cutting scraps left when wool items are manufactured. In the reprocessing of wool, fibers may be damaged. As a result, recycled wool is sometimes lower in quality than some new wool. Less frequently, wool is recycled from fabrics used by the ultimate consumer. These are the lowest quality wool fibers because they have been used and reprocessed. Recycled wools are commonly used to make interlining fabric for coats and jackets and for inexpensive wool products. It is impossible to tell by looking at a piece of fabric whether the wool it contains is new or recycled. Therefore, the labeling information on a wool product is very important.

Silk. ***Silk*** is the product of the silkworm and is obtained from the silkworm's cocoon. Silk is called a ***filament fiber***, one long continuous fiber. The silkworm makes its cocoon as a shell to protect itself during its transformation from caterpillar to moth. Silk harvesters unwind the filament from the cocoon onto silk reels. A typical cocoon will produce 1,000 yards of continuous yarn. The four kinds of silk fibers are cultivated silk, wild or tussah silk, douppioni silk, and waste silk. Silk harvesting, removal of the silk filament from the cocoon, is done by hand and requires much patience. Thus, silk is rather expensive. China is the largest producer of silk fiber, followed by India, Thailand, and Japan. Silk mills in the United States import silk fibers from other countries in order to produce silk fabrics.



Specialty Hair Fibers. Other animal fibers known as specialty hair fibers are also used to make fabric. These fibers are sometimes classified as wools. Examples of specialty hair fibers include camel hair, cashmere, mohair, llama hair, alpaca, horse hair, angora, and vicuña hair.

Camel hair is obtained once each year from double-humped camels raised in all parts of Asia. As a camel's hair falls out in clumps during the spring, the hair is gathered and processed for use in fabric construction. ***Cashmere*** is obtained from cashmere goats raised in Kashmir, China, Tibet, and New Zealand. Once each year, nomadic tribesmen comb the cashmere goats to remove the hair. Each goat provides only four or five ounces of fleece per year, so quantities are limited and cashmere garments are costly. ***Cashgora*** is a new fiber resulting from the breeding of cashmere goats with angora goats in New Zealand. The fiber is not as lustrous as cashmere, and it is much coarser. It is used in less expensive coatings and suitings.

Angora goats, native to the province of Angora, Turkey, produce ***mohair*** fiber. Angora goats are also raised in the United States and in South Africa. In the United States, Texas is the largest producer of mohair. The llama and the alpaca (a domesticated llama), animals raised in the upper regions of the South American Andes Mountains, produce ***llama hair*** fiber and ***alpaca fiber***. ***Horse hair*** is a specialty hair fiber that has decreased in usage recently. Horse hair is primarily used to make upholstery fabrics and backings in suits and coats. ***Angora*** fur is obtained from the Angora rabbit. This special breed of rabbit is raised in China, Europe, Chile, and the United States. ***Vicuña hair*** is obtained from the vicuña, a very rare wild animal from the camel family found in the highest regions of the Andes Mountains. Vicuña hair is now rarely used since the animals must be killed to obtain the fiber. The fabric made from vicuña hair is very luxurious and expensive. Other specialty hair fibers include Qiviut and guanaco.

Vegetable Fibers

Cotton. ***Cotton*** is a popular natural fiber that comes from cotton plants grown primarily in the United States, Eastern Europe, China, and India. In the United States, fourteen states in the South make up an area known as the cotton belt. Texas is the state with the largest acreage of cotton production. Cotton is a relatively inexpensive fiber to produce but the price changes with cycles in the market.

Cotton is grown in warm climates and requires a long growing season. The cotton plant has blossoms that wither and fall off leaving green pods called cotton bolls. A mass of fleecy cotton lint develops inside the seed pod or cotton boll. When the cotton boll is ripe (mature), it opens so that the cotton lint can be seen. The cotton lint is gathered by hand or by machine and ginned to separate the fiber from the seed. The fibers are further cleaned and straightened by the carding process. Cotton fiber may be processed on a combing machine that removes short fibers and naps, resulting in a smooth, uniform yarn called ***combed cotton***. Combed cotton is very fine quality cotton. The quality of cotton depends on the length and fineness of the fiber or staple. Long-staple cottons are the finest quality cottons.

Bast Fibers. ***Bast fibers***, such as flax, hemp, jute, and ramie, are obtained from the inner bark of certain plants. A process called ***retting*** (bacterial rotting) is used to loosen the fibers so they can be removed from the stalk. After the plants are dried, the woody portion is removed. A process called ***hackling***, or ***combing***, is used to separate most of the fibers and to remove the short fibers. During spinning, weaving, and finishing, further separation of fibers occurs. However, some fibers continue to cling together resulting in an uneven texture in some bast fabrics.

Flax fibers come from flax, a weedlike grass. The stem of the flax plant is used for its fiber. Flax grows in a mild, damp climate. It is grown mainly in Western Europe in Belgium, France, Ireland, the United Kingdom, Austria, Switzerland, Italy, and Germany. Flax is also produced in Russia, the Commonwealth of Independent States, and New Zealand.

Linen, the fabric made from flax, is the oldest known fabric and dates back to the Stone Age. At one time, linen was used mainly for bedding. This explains why sheets, towels, and tablecloths are sometimes referred to as linens even though they are rarely made from linen fabric today. Flax was an important crop in the United States until the invention of the cotton gin made cotton cheaper to produce. Today, all flax fiber used in fabric production in the United States is imported.

A less well-known vegetable fiber is ramie. ***Ramie***, sometimes called grasscloth, is a fiber obtained from a shrub grown in hot, humid climates in China, the Philippines, and Brazil. In the United States, ramie has been grown in the Everglades region of Florida, but it is not currently produced in those areas.

Jute comes from fibers in a wooded stalk of a plant grown primarily in India. It is the cheapest textile fiber and the second most widely used vegetable fiber, ranking next to cotton. Most jute is used for bags for sugar, coffee, and other products and in carpet backing, rope, cordage, and twine.

Hemp is another vegetable fiber. Hemp is grown in several regions of the world including parts of the United States. Hemp is not as fine in quality as flax. Therefore, until recently, it has never been used extensively for apparel fabric. Because it is a very strong fiber, hemp is used for twine, cordage, and thread used for stitching shoes. Although commercial production of hemp is not allowed in many countries, including the United States, it is considered environmentally friendly and does not require use of pesticides during its production.

◆ ***Essential Questions: Natural Fibers*** ◆

1. What are the most commonly used natural fibers? What are their sources?
2. What different classification of wool might a consumer find on garment labels? What do these different terms mean?

MANUFACTURED FIBERS

Manufactured fiber is obtained by processing raw material or chemical substances. The process of making manufactured fiber differs from the process of making natural fiber. The main difference is that at some point during manufacturing, the substance used to produce manufactured fiber is not in a fibrous state. Manufactured fiber is sometimes called synthetic fiber or man-made fiber.

Some manufactured fibers have bases of natural plant ***cellulose*** (a carbohydrate that makes up the major part of all plant life). Other fibers are based on protein found in natural products. Some manufactured fibers are made from sand or rubber from rubber trees. The process used to manufacture fibers first involves changing a basic raw material into a thick liquid or solution. The solution is then forced through small holes in a device called a ***spinneret***. This process is called ***extrusion*** and results in the solution coming out of the spinneret in very fine liquid streams.

The fine liquid streams harden into solid, continuous fibers called ***filaments*** or filament fibers.

Manufactured fibers are stretched either while they are hardening or after they have hardened. Stretching reduces the fiber's ***denier*** (diameter) and rearranges the molecules, allowing the fiber to stretch without breaking. The denier of a manufactured fiber indicates its thickness and depends on the design of the spinneret used to make the fiber. Very thin strands are used for sheer fabrics in items such as pantyhose. Very thick strands of manufactured fibers are used to produce items such as tires. Besides manufactured fibers being produced in different denier, they are also made in different shapes for different products. For example, fibers made in certain shapes are used to make carpets because they show less soil and dirt.

A fiber manufacturer sometimes adds certain additives to the solution before it is extruded. Such additives may produce colored fibers or may create a certain finish on the fiber such as flame-resistance. If colors are added to the solution before it is extruded, the process is called solution dying and the fibers are referred to as being ***color sealed***. Color-sealed manufactured fibers have a high degree of ***colorfastness***, meaning the color does not fade easily over time.

Cellulosic and Noncellulosic Fibers

The two basic types of manufactured fibers are cellulosic and noncellulosic. ***Cellulosic*** fibers are produced from cellulose, the fibrous substances found in plants. The three cellulosic manufactured fibers are rayon, triacetate, and acetate. ***Noncellulosic*** fibers are made from molecules containing different combinations of carbon, hydrogen, nitrogen, and oxygen. These substances are obtained from petroleum, natural gas, air, and water. Fiber chemists link these molecules into long chains called ***polymers***.

Cellulosic Fibers. ***Rayon*** was the first manufactured fiber. In 1889, a French chemist exhibited fabrics he called artificial silk. This fiber was originally made from the juice of mulberry leaves. In 1919, J.P. Bunberg made the first commercially successful rayon. The fiber was sold as artificial silk until the name "rayon" was adopted in 1924.

Acetate, introduced in the United States in 1924, was the second manufactured fiber produced from cellulose. ***Triacetate*** was the third cellulosic fiber to be introduced. All three of these cellulosic fibers are made from modified wood pulp that is dissolved into a liquid and extruded through the spinneret.

Lyocell, the first new generic fiber in decades, was initially marketed as a type of rayon in the early 1990s. In 1996, the Federal Trade Commission granted the new fiber classification, and it is produced in both Europe and the United States. Lyocell is a manufactured fiber composed of 100% cellulose. It exhibits properties similar to cotton.

Noncellulosic Fibers. Noncellulosic fibers are made from several polymers. All noncellulosic fibers are made of carbon and hydrogen. Some fibers contain oxygen and nitrogen while others have chlorine as an ingredient. The polymers are usually melted or dissolved and extruded through the spinneret.

Assigning Names to Fibers

The Federal Trade Commission (FTC) has assigned generic names to several manufactured fibers. A ***generic name*** is the official name given to a fiber. The fibers with generic names are all significantly different in their chemical compositions. Each generic fiber is composed of a specific polymer or combination of polymers as defined by the Federal Trade Commission. If a manufacturer invents a new fiber with chemical and physical properties that is very different from the existing fibers, the FTC assigns a new generic name to the fiber. When a generic fiber is changed only slightly, the fiber is called a ***variant***. The following list includes generic names of noncellulosic and cellulosic fibers.

Noncellulosic Fibers

acrylic
anidex
aramid
azlon
glass
lastrile
metallic
modacylic
novoloid
nylon
nytril
olefin
PBI
polyester
rubber
saran
spandex
sulfar
vinal
vinyon

Cellulosic Fibers

rayon
acetate
triacetate
lyocell

When a manufacturer invents one of the generic fibers, the fiber is assigned a brand name or ***trademark*** besides the generic name. The trademark is registered with the United States Patent Office. At that point, the manufacturer who produced the fiber is the only one who can use the registered name or give other manufacturers permission to use the name. Some generic fibers, such as polyester, have many different manufacturers and many different trademarks. It is important to understand the difference between trademarks and generic fiber names. Table 6.1 includes examples of the generic names and trademark names of several manufactured fibers.

HIGH-TECH TIP

A substance called polytetrafluoroethylene (better known as Teflon) was discovered accidentally by a chemist trying to find a new refrigerant gas. The company that developed Teflon first applied it to the surface of pots and pans to prevent food from sticking. Teflon has been used in making space suits for astronauts and the nose cone and reentry heat shields for spacecraft. Because of its water resistance, Teflon was used as a rain and stain repellent for military apparel. Now, the substance is used to provide stain and soil resistance to a variety of textile products including fashion apparel and home fashion textiles (including mattress and pillow ticking, draperies, bedding, upholstery, carpet, and shower curtains). The substance allows easy maintenance by the consumer and protects fabric during handling at the mill and during transportation.

◆ Essential Questions: Manufactured Fibers ◆

1. What are the two basic types of manufactured fibers? What are the differences between the two?
2. What is the difference between a generic fiber name and a trademark name?

Table 6.1 *Manufactured Fiber Names*

Generic Names	Trademark Names
Acetate	Celebrate, Chromspun, Estron, Loftura
Acrylic	Acrilan, Creslan, Orlon, Zefkrome, Zefran
Nylon	Cantrece, Crepeset, Patina, Zafran, Zeftron
Olefin	Avtex, Elustra, Nouvelle, Spectra, Tolaram
Polyester	Dacron, Fortrel, Kodel, Trevira
Rayon	Avril, Coloray, Softglo, Zantrel 700

Properties of Fibers

Abrasion Resistance	Ability to withstand rubbing or abrasion
Absorbency	Ability to absorb liquid and the rate at which the fiber will absorb
Chemical Reactivity	Effect of acids, alkali, oxidizing agents, and solvents on a fiber
Cohesiveness	Ability of fibers to cling together during spinning
Cover	Appearance of fullness and density; a high amount of bulk for its weight
Creep	Ability to gradually recover from strain or gradually stretch under a constant load
Crimp	A wavy physical structure
Density	Weight of a fiber in grams per cubic centimeter
Dyeability	Ability to receive coloration by dyes
Elastic Recovery	Ability to stretch and return to original length
Elongation	Ability to be stretched or lengthened
Feltability	Ability of fibers to mat together
Flammability	Ability to ignite and burn
Flexibility	Ability to be bent or folded
Hand	The feel of a fiber, such as silky, soft, or crisp
Heat Conductivity	Ability to conduct heat away from the body
Loft	Ability to spring back to original thickness after being flattened or compressed
Luster	Amount of light reflected by a fiber
Mildew Resistance	Ability to resist the growth of fungus
Pilling	Formation of pills (balls of fibers) on the surface resulting from abrasion
Resiliency	Ability to spring back to its natural position after folding, creasing, or deformation
Stiffness or Rigidity	Resistance to bending or creasing; opposite of flexibility
Strength (Tenacity)	Ability to withstand pressure without tearing, breaking, or bursting
Sunlight Resistance	Ability to withstand direct sunlight without harm

Table 6.2

FIBER CHARACTERISTICS

Different fibers have different characteristics or properties. These properties are determined by the fiber's external structure, chemical composition, and internal structure. The characteristics of a fiber affect the characteristics of fabric made from that fiber. In addition, the yarn, the finish, and the way a fabric is constructed all affect the type of fabric that results. Understanding the characteristics of different fibers helps to understand how fabrics look, feel, and perform. Table 6.2 includes examples of fiber properties and definitions of the properties. These terms are used throughout the textile and apparel industries to describe fibers and fabrics and are used throughout this reference book. Understanding these basic terms helps in any textile or apparel employment situation.

◆ Essential Questions: Fiber Characteristics ◆

1. How do properties of fibers influence the way a fabric looks, feels, and performs?
2. What are five examples of fiber properties?

FABRIC PRODUCTION

When fabric is produced, specific steps are followed. Fibers are first converted into yarn. ***Yarn*** is a continuous strand of textile fibers, filaments, or material suitable for processing into a textile fabric. Yarn is used to make fabric. The newly constructed fabric is used to make various consumer goods.

Production of Yarn from Fiber

The two main types of yarns are filament yarns and spun yarns. As noted previously, a filament is a single continuous fiber. Silk is the only natural filament fiber. All manufactured fibers are produced as filaments. Manufactured fibers are shipped to textile mills as monofilament yarn, multifilament yarn, tow, staple, and sheet structures. A ***monofilament yarn*** is a single filament of continuous length. A ***multifilament yarn*** is made of two or more continuous monofilaments twisted together. ***Tow*** is made of large bundles of continuous monofilaments assembled but not twisted together. ***Staple*** is made by crimping and cutting tow into short lengths of about one to four inches. In some cases, polymers are extruded as wide sheets of film that are slit into narrow strips. Some natural fibers such as cotton, linen, and wool are classified as staple fibers because they are short in length. Staple fibers must be both spun and twisted to produce yarns.

Yarn made from natural or manufactured continuous filament fibers is referred to as ***filament yarn***. Filament yarn is made by twisting several strands of filament fiber together. ***Spun yarn*** is produced by twisting many staple fibers together. Specific spinning systems are used to spin yarn from staple fibers. These systems are the ***cotton system***, the ***wool system***, and the ***worsted system***. Although these three spinning systems bear the names of three specific natural fibers, the processes are actually used to produce spun yarn from various types of natural and manufactured staple fibers. Table 6.3 summarizes the steps involved in these three spinning systems.

Fabrics made from filament yarns have a different appearance than fabrics made from spun yarns. Fabrics made from filament yarns have a smoother surface and more luster. Fabrics made of spun yarns are often fuzzy unless the fuzz is removed or flattened by a special finishing process. Yarns used for decorative or textured effects can be produced by variations in the spinning and twisting processes.

Cotton Spinning System

1. Fibers are blended in blending machines. The blending process loosens and separates the closely packed fibers, removes dirt and other impurities, and blends the fibers into a uniform mixture.
2. Picking is done by machines that clean fibers further and form them into forty-five-inch-wide laps of fibers.
3. The carding process involves more cleaning, removal of fibers too short for yarns, and partial straightening of fibers so they are parallel.
4. The combing process is used on some fibers; it involves further cleaning and straightening. More short fibers are removed. Fibers are formed into combed slivers (continuous, ropelike strands of loosely assembled fibers without twist).
5. Drawing follows either carding or combing. Several slivers are combined and pulled together. The combined slivers are drawn out into a new sliver no larger than one of the original slivers.
6. A sliver is reduced in size to make a roving. The roving is slightly twisted in preparation for spinning.
7. Spinning is the last stage in yarn manufacturing. The yarn is stretched and the desired amount of twist is used. Several spinning methods are used by different yarn manufacturers.

Wool and Worsted Spinning Systems

1. Fleece is pulled apart and fibers are sorted. Sorting may be done according to fineness, strength, and/or width and length of the fibers.
2. Scouring involves washing in warm soapy water several times, followed by thorough rinsing and drying. Scouring is not necessary when processing manufactured fibers.
3. Carding involves further removal of matter such as twigs and burrs. The process also straightens fibers and arranges them in a parallel position.
4. Combing, an additional straightening process, is done if the fibers are to be made into worsted yarns. Woolen yarns are not combed.
5. Spinning is the last step in converting fibers to yarn.

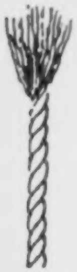
Table 6.3

Classification of Yarns

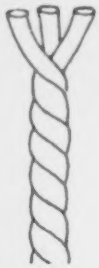
Slub yarns have soft, thick, untwisted areas at intervals creating a textured effect. ***Ratine yarns*** have small, tight loops on the surface. ***Bouclé yarns*** are not twisted as tightly as ratine yarns and the loops are more pronounced. ***Crepe fabrics*** have a pebbly texture produced by using very tightly twisted yarns and alternating the direction of the twist. A ***stretch yarn*** has the ability to stretch when pulled and will return to its original size when released. A ***bulk yarn*** has a soft, thick, fuzzy appearance. Both stretch and bulk yarns are created by producing a permanent curl, loop, or crimp along the filament. The yarn is then heat-set and untwisted.

Yarns are sometimes described by their ply. ***Ply*** refers to the number of strands or yarns twisted together. A ***single-ply yarn*** consists of only one strand of yarn. A ***multiple-ply yarn*** can be separated into several strands of yarn. ***Cord yarn*** is two or more multiple-ply yarns twisted together. Most fabrics are made from single-ply yarns. Multiple-ply yarns are mainly used to construct very durable garments such as work clothes or are used when fibers are very fine and fragile.

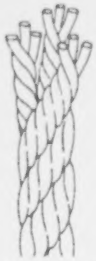
Yarns are classified as simple yarns or blended yarns. A ***simple yarn*** is made of only one fiber, such as silk. A ***blended yarn*** is made of two or more fibers spun together.



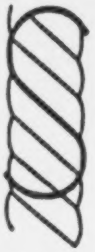
Single-ply Yarn



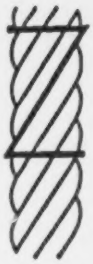
Multiple-ply Yarn



Cord Yard



S-twist



Z-twist

The advantage of blending fibers is that the good properties of both fibers are obtained. For example, if polyester and cotton are blended, the resulting fabric is absorbent like cotton and requires little or no pressing due to the polyester fibers. A ***combination yarn*** is a multiple-ply yarn with each ply made of a different fiber.

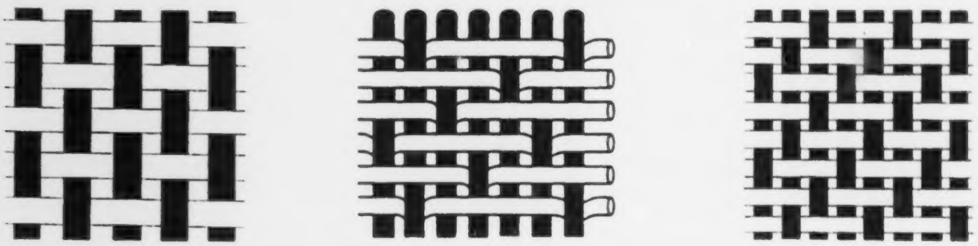
The amount of twist varies with the length of the fibers, the size of the yarn, and its intended use. Increasing the amount of twist to the point of perfect fiber-to-fiber cohesion increases the strength of the yarn. However, excess twist causes the yarn to lose strength. Increasing yarn twist also affects yarn hairiness, comfort, cost, and linting. The direction of yarn twist is described as either ***S-twist*** or ***Z-twist***. Z-twist is the most common for weaving yarns.

Production of Fabric from Yarn

Fabric is produced through felting, bonding, weaving, or knitting. ***Felting*** is a process in which fibers (not yarns) are pressed together to form fabric. Only certain fibers such as wool, hair fibers, and fibers from fur-bearing animals are felted. Fibers are moistened, exposed to steam, and passed between rollers causing the fibers to be matted together.

Bonding involves use of an adhesive substance to hold together either fibers or separate layers of fabric. ***Nonwoven fabrics*** that consist only of fibers are bonded. Interfacing material (a layer of fabric used to give a garment support and shape) is an example of a nonwoven, bonded fabric. In some cases, a lining is bonded to an outer fabric, preventing the need for a separate underlining.

The weaving process involves interlacing two or more yarns at right angles to each other. ***Woven fabrics*** are made of warp yarns and weft (or filling) yarns. ***Warp yarns*** are lengthwise yarns woven along the entire length of the fabric. ***Weft yarns*** are crosswise yarns woven across the fabric. Warp yarns are parallel to the selvage. The ***selvage*** is a narrow woven edge made with special, strong yarns that are woven tightly to prevent raveling. Different weaving patterns are used to create different appearances. The three basic weaving patterns are the plain weave, the satin weave, and the twill weave. Figure 6.1 shows illustrations of these three weaves.



Plain Weave *Satin Weave* *Twill Weave*

Figure 6.1

Knitted fabrics are made by looping or interlocking yarns together. There are two basic kinds of knitting. ***Weft knitting*** (filling knitting) is similar to hand knitting and is done with only one yarn. Jersey is an example of a weft knit fabric. A disadvantage of this kind of knitting is the tendency for the fabric to run if a thread is broken. ***Warp knitting*** involves the use of several yarns at one time and is done by the flat (straight) knit method.. Warp knit fabrics are stronger and more firm than weft knits. However, they do not stretch as easily. Tricot, a run resistant fabric, is an example of warp knitting.

◆ Essential Questions: Fabric Production ◆

1. What are the differences in procedures used in the three basic yarn spinning systems?
2. How does the amount of twist impact yarn strength?
3. What are the differences in felting, bonding, weaving, and knitting?

FABRIC FINISHES

After yarns have been woven or knitted into fabric, several processes must be followed before fabric is sold to consumers or used to make consumer goods. As discussed in Chapter Two, the fabrics that come from the loom or knitting machine are called greige goods or gray goods. Finishes are applied to fabrics for different reasons. Some finishes simply make greige goods usable. Some finishes make fabrics more attractive by changing the appearance or texture. Other finishes may improve the performance of fabrics by adding desirable characteristics.

Finishes that Prepare Fabrics for Use

Cleaning is done by washing, scouring, or dry cleaning to remove foreign substances from greige goods. ***Bleaching*** is necessary to remove all natural coloring in the fibers. Usually, chemical bleaching is done. However, cotton may be bleached by washing and exposing the fabric to the sun. Linen may be bleached by long exposure to sunlight, air, and moisture.

Processes may be applied to fabrics to achieve ***shrinkage control***. Shrinking may be done by using chemicals, water, or steam. Textile product labels may include the terms ***shrunk*** or ***preshrunk*** to indicate that shrinkage control has been applied. The label on a textile product must also state how much additional shrinkage (in percentage) may occur when the fabric is washed or cleaned.

Singeing is a process that leaves a smooth surface by removing any unwanted substance from fabric. By passing fabric rapidly through a flame, lint, threads, fuzz, and fiber ends are removed. ***Calendering*** is an ironing process used to smooth and press fabric.

Tentering is a process used to cause irregularly shaped cloth to be stretched or shrunk until it is even. Tentering causes the lengthwise and crosswise yarns to be at right angles to each other if done properly. Fabric is ***on-grain*** when the lengthwise and crosswise yarns are at right angles. Fabric is ***off-grain*** if the lengthwise and crosswise yarns are not at right angles. Fabrics that are off-grain are not of high quality and cause textile products to be inferior. For example a skirt made from off-grain fabric will not hang evenly. Jeans made from off-grain denim may have seams that do not hang straight.

Crabbing is a process used on wool fabric to set the width and position of the yarns. The process involves moving fabric over rollers with exposure to steam and cold water. The fabric is then pressed.

Finishes that Affect Appearance

Mercerizing is a chemical process that may be applied to either yarn or fabric. The process produces luster in cotton and linen. The yarn or fabric is treated with a caustic soda solution under tension. Then the yarn or fabric is rinsed, exposed to a warm acid bath, rinsed, and dried. Mercerization also strengthens the fibers and makes them more absorbent.

Sizing involves adding a substance to a fabric to give it additional firmness, weight, and stiffness. A starch may be added that is temporary and will wash out, or a permanent chemical sizing may be used that lasts the life of the garment. Poor-quality, loosely woven fabric may be sized in order to give the appearance of being closely woven. If a soluble starch is used, the sizing will wash out of the fabric.

Napping produces a fluffy, soft-textured fabric by brushing up fiber ends that extend from the surface of the fabric. ***Nap*** is the surface fuzziness that results. Cotton and wool flannels are examples of fabrics finished with the napping process. ***Shearing*** is a process used to cut the thread ends of napped fabrics and pile fabrics to an even length so that the surface is smooth and regular. ***Sueding*** is a variation of brushing and napping in which the fiber ends are sheared very close to the surface of the fabric. The ***embossing*** process involves running fabric through heated, engraved rollers to transfer a design onto the fabric. Textured effects are produced.

Dyeing and printing are processes used to add color to fabric. Dyeing may be done by any of the following processes during different stages of fabric construction:

- ***stock dyeing*** - Dye is added to the fibers before yarn processing is done.
- ***solution dyeing*** - Dye is added to the solution before manufactured fibers are extruded.
- ***yarn dyeing*** - Dye is added to the yarns before weaving or knitting.
- ***piece dyeing*** - Fabric is dyed after weaving.
- ***resist dyeing*** - The yarn or fabric is treated before dyeing so the treated portion resists dye.
- ***cross dyeing*** - Piece dyeing is done to fabric containing certain fibers that absorb different dyes.

Regardless of the stage in which dyeing is done, the substance is immersed in a solution so that the dye completely saturates it. Some manufactured fibers are dyed in the solution stage before the solution is forced through the spinneret to form filaments.

Printing is a process used to apply patterns or color designs to fabric. When a fabric is printed, it is easy to distinguish the right and wrong sides of the fabric. The printed side of the fabric is more distinct than the wrong side since the color does not penetrate the fabric completely. When a fabric is dyed, the colors are usually the same on both sides of the fabric. Different types of printing include engraved roller printing, screen printing, and heat transfer printing.

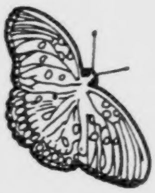
Engraved roller printing involves use of a separate roller engraving for each color in a pattern. The design is rolled onto the fabric as it passes through the printing machine. ***Screen printing*** can be either flat-bed screen printing or rotary screen printing. Both types of screen printing involve forcing color through a porous screen onto fabric. The areas of the fabric that are not to be printed are covered or coated with enamel. ***Heat transfer printing*** involves the use of rotary screens or rollers to print dye onto paper. The paper and fabric are put through hot rollers so that the dye is transferred from the paper to the fabric.

Finishes that Improve Performance

Wrinkle resistance can be achieved by applying a finish to fabrics such as cottons, linens, and spun rayons. The finish makes the fabric resistant to creasing or wrinkling, perspiration, odor, and mildew. Wrinkle resistant finishes produce improved wash-and-wear qualities. Little or no ironing is required after laundering. Wrinkle resistant fabrics are not as absorbent; static electricity may accumulate; and grease and oil stains are difficult to remove.

Water-repellent finishes prevent fabrics from absorbing water. Substances are used to coat the fabric to prevent absorption of water. To make fabric totally waterproof, it must be coated with rubber or plastic which closes the pores.

Mothproofing is done by applying chemicals to wools or wool blends to protect the fabric from damage by moths. The finish is permanent and withstands washing and dry cleaning. ***Insulation*** is achieved by finishes that add warmth to a fabric without weight. Metallic particles are sprayed on the fabric to keep body heat in and prevent cold air from entering. Stain-resistant finishes are used to protect fabric from stains as well as making fabric water repellent.



When wash-and-wear chemical finishes are added to fabrics, quicker drying is possible and little or no ironing is needed. A durable press finish provides a no-iron, permanently pressed finish.

◆ ***Essential Questions: Fabric Finishes*** ◆

1. What are the purposes of fabric finishes?
2. What are examples of fabric finishes:
   that prepare fabrics for use?
   that affect appearance?
   that improve performance?

QUALITIES, USES, AND CARE OF FIBERS AND FABRICS

Knowledge of fabric characteristics is important when constructing, altering, and caring for garments. Fabric construction, fiber content, and yarn construction all work together to determine such qualities as the appearance, hand, strength, absorbency, warmth, and beauty of a fabric. These qualities directly influence the performance of a fabric in terms of wear and care.

Many different types of fabrics are available today. In addition to fabrics made from natural fibers and manufactured fibers, there are fabrics that result from blending or combining different types of fibers. The combinations and resulting fabrics are endless. Refer to table 6.4 for examples of natural fibers and to table 6.5 for examples of manufactured fibers that are used in fabric construction. The tables provide a summary of the general characteristics of the identified fibers, common uses of the fibers, and general care guidelines.

Each type of fabric is unique as a result of the fiber content, the fabric construction methods used, and the finishes applied. In addition, each garment is unique because of the way it is constructed. Therefore, careful attention to the manufacturer's recommended care instructions is vital in order to extend the life of the fabric or garment.

Care instructions are found on ***care labels*** that are sewn into the seams of finished garments. Following instructions on care labels protects and extends the life of garments.

According to the ***1972 Care Labeling Act***, all finished garments and fabric sold for making apparel must have attached labels that include procedures for regular garment maintenance. The care instructions must include specific guidelines for washing, drying, and pressing or for professional dry cleaning.

Qualities, Uses, and Care of Natural Fibers

Fibers	Qualities	Suggested Uses	Care
Camel's Hair	fine, soft, lustrous; good insulation; lightweight; relatively weak; not durable	***Fabrics:*** often blended with wool ***Apparel:*** suits, coats, & sweaters ***Other:*** blankets, ropes, paintbrushes, & industrial fiber	dry-clean, subject to damage from abrasion
Cashmere	soft, silky, luxurious, expensive	***Apparel:*** sweaters, jackets, suits, & coats ***Other:*** yarn	dry-clean, careful handling required
Cotton	absorbs dye easily; very durable; stronger when wet; wrinkles easily; absorbs moisture; dries quickly; low elasticity; low luster unless treated; comfortable in hot weather; flammable; shrinks	***Fabrics:*** lightweight fabrics such as voile & batiste; heavy & thick fabrics such as corduroy, flannel, & chenille; strong & sturdy fabrics such as denim ***Apparel:*** summer clothes such as dresses, skirts, shirts, blouses, & sportswear; underwear ***Other:*** bed linens, table linens, draperies, upholstery fabrics, towels, & slipcovers	wash; shrinks when washed; iron while damp; may dry-clean; extended exposure to sunlight causes deterioration & weakening of fiber; scorches with very hot iron temperatures
Linen	cool; lightweight; strong; stronger when wet; good hand; good luster; absorbs moisture; dries quickly; poor resistance to abrasion; poor elasticity; wrinkles easily	***Fabrics:*** fine fabrics such as handkerchief linens to coarse fabrics such as crash, a fabric used to make dish towels ***Apparel:*** summer and fall clothes such as dresses & suits ***Other:*** table linens, dish towels, tea towels, curtains, slipcovers, & upholstery fabrics	dry-clean for crispness; wash for softness; may shrink when washed; iron while damp; iron on right side to increase luster; high safe ironing temperature of 450°F
Ramie	silk-like luster; very strong; stronger when wet; excellent abrasion resistance; high mildew & rotting resistance; stiff; poor elasticity	***Fabrics:*** used alone or blended with polyester, cotton, linen, & acrylics ***Apparel:*** dresses, suits, & shirts ***Other:*** tablecloths & napkins; home furnishing materials; industrial thread; filter cloths; & fish nets	machine wash; breaks if folded repeatedly in same place; requires ironing
Silk	luxurious hand; absorbs dye well; high luster; good insulation; drapes well; very strong; good elasticity; lightweight; comfortable; beautiful; fairly durable; less strong when wet; can be attacked by moths; builds up static electricity in dry climates	***Fabrics:*** luxurious fabrics in many weights such as chiffon, crepe, satin, & jersey ***Apparel:*** fine garments such as dresses, suits, scarves, linings, & blouses ***Other:*** some used in home furnishings such as drapery & upholstery fabrics	avoid prolonged exposure to sunlight; turns yellow if exposed to chlorine bleach; dry-clean for best results; high safe ironing temperature of 300° F; use press cloth to iron; hang garment to remove some creases
Wool	good resiliency when dry; poor resiliency when wet; fair hand; good drape; good elasticity; absorbs moisture slowly; dries slowly; good insulation; little static problem; fairly durable; luster varies; can be attacked by insects; pilling occurs; flame resistant; resistant to acids	***Fabrics:*** lightweight fabrics such as challis, broadcloth, flannel, & crepe; heavier fabrics such as chinchilla cloth, tweeds, jacquards, jersey, & velour ***Apparel:*** fall & winter suits, coats, sweaters, dresses, skirts, & childrenswear ***Other:*** blankets, upholstery fabrics, rugs, & carpets	hang dry garment in a moist room to remove wrinkles; place wet garments flat to dry; dry-clean or hand-wash as recommended; brush garments frequently; turns yellow if washed with chlorine bleach; mothproof when storing

Table 6.4

Qualities, Uses, and Care of Manufactured Fibers

Fibers	Qualities	Uses	Care
Acetate	luxurious feel & appearance; wide range of colors; good drapability; soft; resistant to shrinkage, moths, & mildew; low strength; poor elasticity; builds up static electricity charges; melts when heated; special dyes used on acetate fade	***Fabrics:*** brocade, crepe, double knits, faille, knitted jerseys, lace, & tricot. ***Apparel:*** blouses, dresses, lingerie, foundation garments, linings, shirts, slacks, & sportswear ***Other:*** draperies, upholstery fabrics, cigarette filters, fiberfill for pillows, & quilted products	wash with care; dry-clean acetate without shrink-resistant finish; protect from mildew when storing; may be attacked by silverfish if heavily starched; avoid spilling acetone on acetate fabric because fibers will be dissolved
Acrylic	soft; warm; wool-like; lightweight; retains shape; resilient; dries quickly; resistant to moths, sunlight, oil, & chemicals; low absorbency; static electricity charges build up; ignites and burns easily	***Fabrics:*** fleece & pile fabrics, face portion of bonded fabrics, simulated furs, & jerseys ***Apparel:*** dresses, infant wear, knitted garments, skirts, ski wear, socks, sportswear, & sweaters ***Other:*** blankets, carpets, draperies, upholstery fabrics, knitting yarns, & craft yarns	different acrylic fibers vary in care; usually dry-clean or wash; use low settings on dryer; remove from dryer immediately after tumbling; high safe iron temperature of 250°F
Nylon	very strong; supple; resistant to abrasion; lustrous; easy to wash; resistant to damage from oils, chemicals, insects, & sunlight; resilent; low moisture absorbency; excellent elasticity; builds up static electricity charges; fibers melt with high heat; chemically stable; pilling occurs	***Fabrics:*** various fabrics from fine to coarse, soft to crisp, & sheer to opaque ***Apparel:*** blouses, dresses, foundation garments, hosiery, lingerie, underwear, raincoats, ski and snow apparel, suits, & windbreakers ***Other:*** bedspreads, carpets, draperies, curtains, upholstery, air hoses, conveyor & seat belts, parachutes, racket strings, ropes, sleeping bags, tents, & tire cord	machine wash and tumble dry most nylon fabrics; remove from dryer when cycle ends; shrinks when washed; remove oil-borne stains with grease solvent before laundering; wash white nylon fabrics alone
Polyester	relatively strong; resistant to stretching, shrinking, most chemicals, insects, sunlight, wrinkling, & abrasion; quick drying; crisp & resilient; retains heat-set pleats & creases; easy to wash; good elasticity; fibers melt at high temperatures	***Fabrics:*** often blended with other fibers such as cotton, silk, linen, or wool; fabrics are usually medium weight ***Apparel:*** blouses, shirts, career apparel, chidren's wear, dresses, insulated garments, ties, lingerie & underwear; permanent press garments, slacks, & suits ***Other:*** fiberfill for different products, fire hose, ropes, nets, tire cord, & sails	machine wash usually; use warm water temperatures; remove oily stains with grease solvent before laundering; remove from dryer when cycle ends; high safe iron temperature of 450° F; follow care label instructions for blends
Rayon	not strong; less strong when wet; low elastic recovery; low resiliency; very absorbent; soft; comfortable; absorbs dye well; drapes well; does not build up static electricity charges; scorches at high temperatures; ignites and burns easily	***Fabrics:*** often blended with fibers such as polyester & cotton ***Apparel:*** blouses, coats, dresses, jackets, lingerie, linings, rainwear, slacks, sport shirts, sportswear, suits, thermal underwear, & ties ***Other:*** diapers, towels, bedspreads, blankets, carpets, curtains, draperies, sheets, slipcovers, tablecloths, upholstery, medical/surgical products, & tire cord	dry-clean; shrinks if dryed in automatic dryer; high safe iron temperature of 250° F; follow care label instructions for blends

Table 6.5

Labels must be placed in garments so that they can be seen or easily found by consumers at the point of sale. If packaging hides the label, additional information should appear on the outside of the package or on a hang tag fastened to the product.

In 1997, the Federal Trade Commission modified the Care Labeling Act to allow the option of using care symbols only on the label. The use of care symbols is not mandatory, but optional, so consumers may continue to see products with written care instructions.

◆ Essential Questions: ◆ Qualities, Use, and Care of Fibers and Fabrics

1. How do fiber qualities influence use and care of the resulting fabrics?
2. What is the purpose of care labels on finished garments?

CONSUMER ACCEPTANCE OF APPAREL

Fashion is a powerful influence in the lives of people. The terms fashion and style are often confused. A ***style*** is a type of product that has one or more specific features or characteristics that distinguish it and make it different from other products of the same type. For example, a blazer and a safari jacket are two different styles of jackets. One style may include many variations in decoration, texture, color, trimmings, and other details.

The individual interpretations or versions of one style are called ***designs***. When a style becomes popular, many different designs or versions of the style are produced. Each producer assigns a ***style number*** to each design in the line to identify it in production, selling, and shipping. A ***line*** is a group of clothing designed and manufactured by a firm or a designer. ***Fashion*** is defined as the prevailing or accepted style in dress adopted at a particular time. A style does not become a fashion until it is accepted by consumers. A style remains in fashion only as long as it is accepted by consumers.

Some styles go in and out of fashion repeatedly. For example, padded shoulders and circular skirts are styles that have been fashionable at various times throughout history. A ***classic*** is a style that continues to be accepted, to some degree, over an extended period of time. Examples of classics are cardigan sweaters and men's oxford cloth button-down collared shirts. In contrast, some styles become popular suddenly, are accepted quickly, and disappear quickly. These styles are called ***fads***. The Nehru jacket was an example of a fad that was adopted by men several years ago but quickly decreased in popularity.

High fashion is a term used to describe a very new and expensive style. Only a few people accept high fashion items because of the high cost and because only a few people are willing to adopt different styles at first. Some styles are accepted by large numbers of people. As mentioned previously, these styles are called mass fashions. Fashion is a concept that involves movement. The directions in which fashions move are called ***fashion trends***. For example, men's ties may change from wider to narrower or the athletic look in clothing may become more or less popular.

Even though fashion trends may only change slightly, certain directions can be identified. Figure 6.2 includes examples of how women's fashions have changed gradually over a period of several decades. People employed in the textile and apparel industries must plan ahead and project fashion trends. Success in the fashion industry often depends on the ability of designers, buyers, and other employees to recognize fashion trends and changes. The term ***forward fashions*** is often used to refer to styles that are gaining acceptance.

A variety of factors influence the consumer's interest in fashion. Changes in people's attitudes and changes in lifestyles result in changes in fashion. Social influences such as changes in women's status and changes in men's roles influence fashion. Political situations influence fashion. For example, when the United States has a good trade relationship with a particular country, fashion in this country may be greatly influenced by the style of dress in the other country.

Economic influences have impact on fashion also. The amount of money consumers spend on fashion and other goods depends on their incomes. Fashion acceptance is therefore influenced by the stability of the economy. Technology also influences fashion. Mass production, transportation, and improved communication are examples of technological factors that have changed the fashion industry. Marketing is another factor that influences fashion. Marketing involves activities such as advertising and publicity used to stimulate consumer interest. Improved marketing techniques and the ability to communicate through the media have greatly influenced consumer acceptance of fashion.

The life span of a fashion is known as a ***fashion cycle***. The five major stages in each fashion cycle are the introduction, rise in popularity, peak in popularity, decline in popularity, and rejection. The fashion cycle can be used to show the acceptance of a single style from one designer or of a general style of apparel. Different fashions vary in their life spans, in the degree of acceptance they experience, and in the rate at which they progress through the stages of the fashion cycle. Figure 6.3 shows one version of the fashion cycle. Sometimes the fashion cycle is pictured on a bell-shaped curve.

◆ Essential Questions: ◆ Consumer Acceptance of Apparel

1. What is the difference between a style and a fashion?
2. What factors influence fashion trends?
3. What is a fashion cycle?

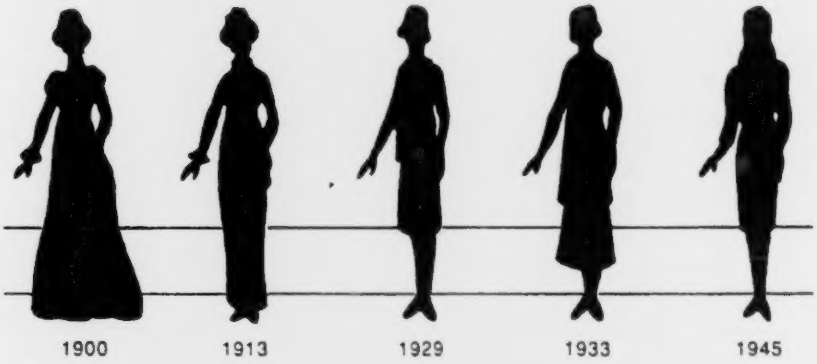


Figure 6.2

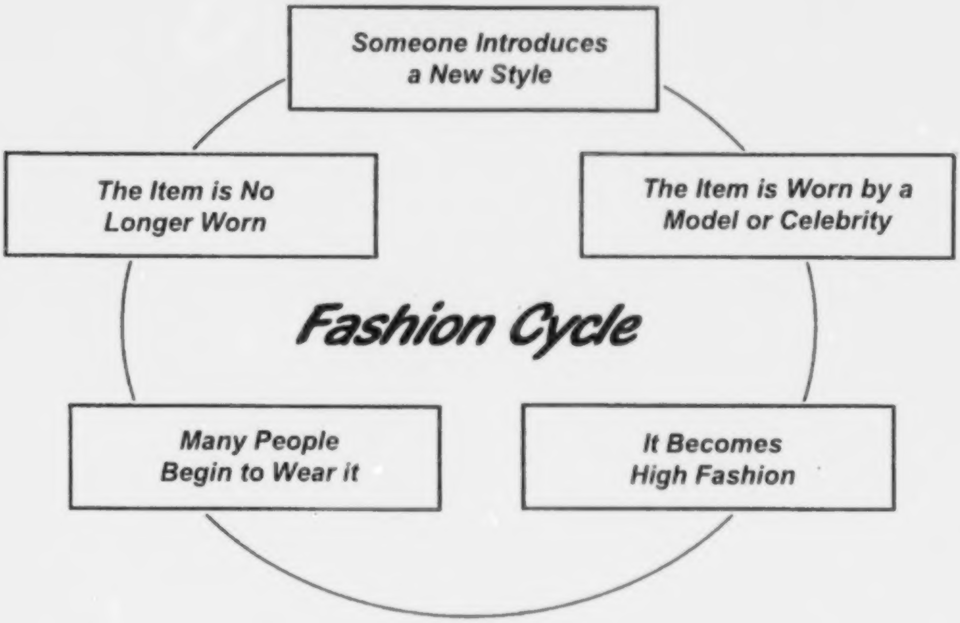

Someone Introduces a New Style
The Item is Worn by a Model or Celebrity
It Becomes High Fashion
Many People Begin to Wear it
The Item is No Longer Worn
Fashion Cycle

Figure 6.3

Chapter Highlights

- ☆ The terms fabric, cloth, and textiles are often used interchangeably.
- ☆ In order to describe the quality or characteristics of textile products or answer customers' questions, it is necessary to understand the basic procedures used in manufacturing such products.
- ☆ Natural fibers are classified as either animal or vegetable fibers. The animal fibers most commonly used to make consumer goods are wool and silk. Cotton and linen are the two vegetable fibers most often used to make consumer goods.
- ☆ Manufactured fiber is obtained by processing raw material or chemical substances. The process of making manufactured fiber differs from the process of producing natural fiber. The main difference is that at some point during manufacturing, the substance used to produce manufactured fiber is not in a fibrous state. The two basic types of manufactured fibers are cellulosic and noncellulosic. Cellulosic fibers include rayon, triacetate, and acetate. There are currently twenty noncellulosic fibers that have been assigned generic names.
- ☆ Generic names are assigned to different manufactured fibers by the Federal Trade Commission. When different manufacturers produce the same generic fiber, each manufacturer assigns a trademark to their product.

(Continued on page 96)

Chapter Highlights

(Continued from page 95)

- Each type of fiber has different characteristics or properties. The properties of a fiber affect the characteristics of fabric made from the fiber.

- There are two main types of yarns, filament yarns and spun yarns. Filament yarns are made by twisting together several strands of fiber. Spun yarns are produced by twisting many staple fibers together. Fabrics made from filament yarns have a smooth lustrous surface. Fabrics made from spun yarns often have a fuzzy surface.

- There are three different spinning systems used to produce spun yarn. The systems are the cotton, wool, and worsted spinning systems. These systems are used to spin yarn from both natural and manufactured fibers.

- Yarns are sometimes described by their ply. Most fabrics are made from single-ply yarns.

- Yarns are classified as simple yarns, blended yarns, or combination yarns. The advantage of using blended fibers is that the desirable characteristics of both fibers are obtained.

- Fabric is produced by felting, bonding, weaving, or knitting.

- Knitted fabrics are made by looping or interlocking yarns together. Weft knitting and warp knitting are the two basic types of knitting.

- After yarns have been woven or knitted into fabric, several finishing processes must be followed before the fabric is sold to consumers or used to make consumer goods.

- Finishes are applied to make greige goods usable, to make fabrics more attractive, or to improve the fabric's performance.

- Knowledge of fabric characteristics is important when constructing, altering, and caring for garments. Fabric construction, fiber content, and yarn construction all work together to determine such qualities as the appearance, hand, strength, absorbency, warmth, and beauty of a fabric.

- Fashion is a powerful influence in the lives of people. When a specific style becomes accepted by consumers, it becomes a fashion. Fashion moves in certain directions called fashion trends. Various factors influence consumer acceptance of fashion. As fashions are accepted, gain in popularity, and decline in popularity, they go through fashion cycles.

Chapter 7

Elements & Principles of Design

Chapter Focus

The following Essential Knowledge and Skills are discussed in this chapter:

4A Analyze elements and principles of design as related to apparel.

6E Apply elements and principles of design in altering, repairing, and customizing textile and apparel products.

Chapter Vocabulary

accented neutral
analogous
back fullness silhouette
balance
bell silhouette
color wheel
complementary
cool colors
decorative lines
design
double complementary
elements of design
emphasis
formal or symmetrical balance
harmony or unity
hue
informal or asymmetrical balance
intensity
line
monochromatic
primary colors
primary neutrals
principles of design
progression or gradation
proportion
quaternary colors
repetition
rhythm
scale
secondary colors
shade
shape or form
space
split complementary
structural lines
tertiary or intermediate colors
texture
tint
tones
transition
triad
tubular silhouette
value
warm colors

Design refers to the organization or arrangement of parts that make up a structure or work of art. People react to design each day. Design appears in various surroundings, such as homes, buildings, furnishings, and clothing. Poor design causes negative reactions from people. Poorly designed items are usually considered to be confusing, out-of-place, or unattractive. People usually react positively to good design. Good design does not happen by accident. It is planned and results from combining various elements and principles in an appropriate manner.

Design influences the clothes we buy and the fabrics we select. It is important for employees in the textile and apparel industries to be able to recognize and apply good design. People are not born with good taste. Good taste involves knowing how to combine elements and principles of design according to current fashion trends in order to develop a pleasing arrangement of parts.

An individual can develop good taste by learning the parts that make a good design. The parts of a design are called the ***elements of design***. The elements are line, shape/form, space, texture, and color. These elements are used by fabric and fashion designers. The elements and principles of design also influence the construction and alteration of garments. Knowledge of the elements and principles of design is used in describing fabrics and fashions to customers, in developing fashion displays, and in planning promotional events such as fashion shows.

ELEMENTS OF DESIGN

The end result of a design should be a visual process. The elements of design used in apparel should be flexible. They are meant to be interpreted within the current fashion styles and trends or to enable the designer to solve a particular problem. Designers use the elements of design to create optical illusions. The elements of design are the ingredients a designer works with in creating any design. After a design is created, the elements of design influence the procedures used to construct and alter the garment.

Line

Line is the element of design that indicates direction, length, width, and straightness. All lines in design are either straight or curved. Usually straight and curved lines are combined in any design. Lines are found in the structure of each garment as well as in the design of the fabric used to construct the garment. A line is versatile and can define or limit shape and suggest movement, speed, or direction. A line leads one's gaze from one end of the line to the other. Each type of line creates a different mood or effect. The four types of lines are vertical, horizontal, diagonal, and curved. Different combinations of these lines can provide a variety of design possibilities. Figure 7.1 shows these four types of lines found in design.

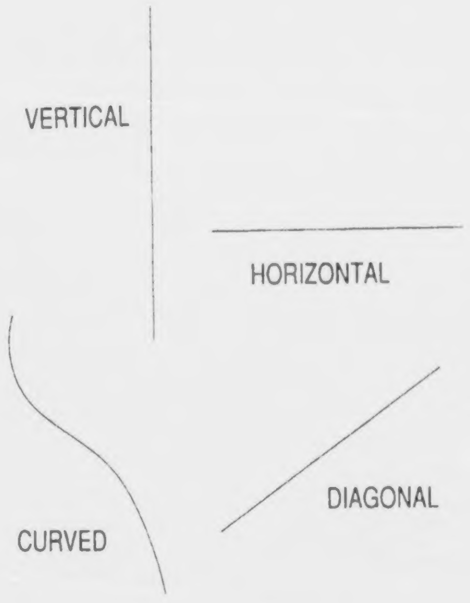


Figure 7.1

Straight lines give a feeling of strength and severity. Direction in line can be vertical, horizontal, or diagonal. Vertical lines go up and down. Vertical lines are the strongest type of line and give an impression of dignity, discipline, and strength. Vertical lines suggest height. Broad, vertical lines create width. In general, vertical lines suggest stability.

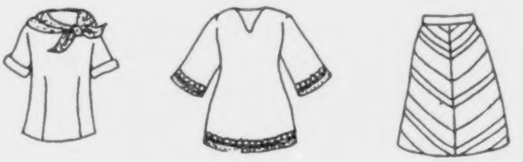
Horizontal lines go from side to side or are parallel to the ground. Horizontal lines are not as strong as vertical lines and create a sense of rest. These lines suggest serenity, repose, and relaxation. Horizontal lines may be used to relieve or decrease the effects of strong vertical lines. Horizontal lines usually make the figure appear broader. A horizontal line placed high on the body may make the figure appear taller.

Diagonal lines are neither horizontal or vertical, but slanted. These lines break the monotony of vertical and horizontal lines by expressing excitement and movement. They are more difficult to use successfully. Diagonal lines tend to point into space and unless they are decisively stopped, can keep the eye moving right off the garment. The herringbone pattern is an example of a well-controlled diagonal line. The lines meet to form Vs giving a sense of completion and restfulness.

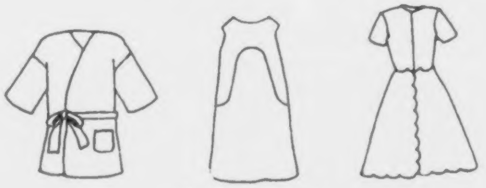
Curved lines suggest grace, youth, and subtle motion. They are lively, more fun than straight lines, and typically add softness to a design. Using too many curved lines in a garment may create a restless feeling. This effect can be corrected by strengthening the straight lines, eliminating some of the curved ones, or doing both. A garment that appears too stiff from too many straight lines can be softened by the use of curved lines. Vertical, horizontal, and diagonal lines are typically straight lines. Curved lines can also be used to show direction. Wavy lines that are arranged in a certain design can appear to have a horizontal direction just as a straight line arranged in a similar manner.

The width of lines in a design can vary greatly and give different effects. A narrow line will give a different effect than that of a wide line even though the lines may have the same direction. The lengths of lines can also vary greatly and give different effects. The appearance of several short lines differs greatly from the appearance of one long or several long lines.

Lines in clothing help give garments shape. These garment lines can be structural, decorative, or both. ***Structural lines***, sometimes called ***construction lines***, are the basic lines of a garment such as the yokes, seamlines, pockets, necklines, pleating, and sleeves. These lines may be horizontal, vertical, diagonal, or curved. Structural lines are most noticeable in garments of solid colored fabric. ***Decorative lines*** are those lines present in the fabric design or construction and can be added by applying trim, accessories, and stitching. Decorative lines give a garment individuality. Figure 7.2 shows examples of structural and decorative lines in garments.



Decorative Lines



Structural Lines

Figure 7.2

If a garment is made from a solid colored fabric or a fabric with a very simple design, structural lines will be the most noticeable lines in the garment. Decorative lines are much more noticeable in a garment than the lines created by using stripes or plaid fabrics. Decorative lines can also accent structural lines through repetition and contrast and can be created to accent large areas through smocking, shirring, appliqué, and pin tucks.

The following guidelines may be used to design, select, construct, and alter apparel that will compliment each customer's figure:

- A garment with a centered vertical line adds height and slims the figure.
- A series of vertical parallel lines, such as stripes or pleats, force the eye to travel around the figure. These lines add height and width to the figure. The closer the parallel lines are, the less wide the figure appears to be.
- An asymmetrical or off-centered vertical line adds height and cuts the weight of the figure.
- A T-line, a vertical line cut by a horizontal line, adds less height than a single vertical line; the T-line also adds width at the shoulders and causes the waist and hips to look smaller. It is a good choice for a tall person.
- An arrow line adds height and narrows the shoulders. It is a good choice for a short, broad-shouldered person.
- A Y-line adds height and width to narrow shoulders and looks attractive on full figures.
- Diagonal lines do not change the figure's height and width, but do add interest and eye appeal and slenderize the figure. Diagonal lines look attractive on all but the very thin person.
- Horizontal lines make any figure appear shorter and heavier. The lower the horizontal line, the shorter the person looks. A low horizontal line, produced by wearing a long tunic or three-quarter-length coat may make a short person look dumpy and a tall person look more attractive.

These guidelines provide examples of how the interaction of various types of lines result in different effects on garments. Figure 7.3 illustrates how several vertical lines of the same length look different when other types of lines interact with them.

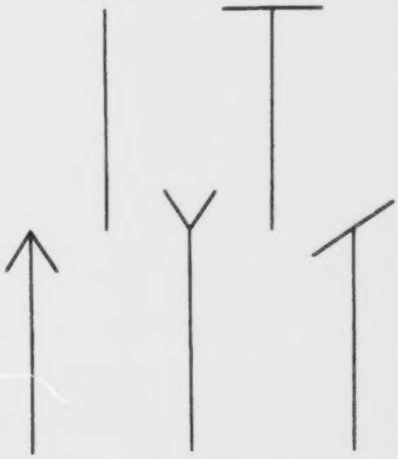


Figure 7.3

Shape/Form

Lines are combined to create and define shape or form. The lines in a garment can represent anything from a geometric shape to an object. The basic shapes formed by lines are the square, rectangle, triangle, and circle. These can be combined to create a variety of more complex shapes. The types of lines combined in creating a shape determine the feeling conveyed by that shape. Curved lines form circles, ovals, and ellipses while straight lines create squares, rectangles, and triangles.

The proportion of these forms or shapes is an important factor in design. Squares and rectangles produce a feeling of mathematical precision while circles and ovals convey a feeling of completeness. If there is no pattern to an arrangement of forms, the effect may be jumpy. Shapes and forms that are related to each other complement each other. A form can also give an impression of lightness or heaviness. This impression depends on the fabric, especially the texture of the fabric, from which the garment is made. A certain amount of diversity of forms is desirable as long as the different forms are harmonious.

Shape or ***form*** includes the silhouette formed by the outline of a clothing design. The silhouette is often considered the most important design line in clothing. As defined previously, the silhouette is the outline or overall shape of a garment. The silhouette encloses all other lines of a garment. The three classic silhouettes are bell, tubular, and back fullness. There have been variations of hem lengths, positions of waistlines, and styles of clothing, but certain basic shapes have remained the same.

The ***bell silhouette*** is characterized by a fitted waist and full skirt or pant leg. Capes and full skirts are examples of this silhouette type. The ***back fullness silhouette***, or bustle, is characterized by fullness in the back but not in the front of the garment. Fabric is occasionally draped at the back hipline to give fullness. Suit jackets often flare in the back. The ***tubular silhouette*** is characterized by a slim skirt. It may have a low or high waistline. It is often left unbelted hanging straight from the shoulders to the hem. Each individual should select garment silhouettes that compliment his or her body shape. Figure 7.4 includes examples of the three classic silhouettes.

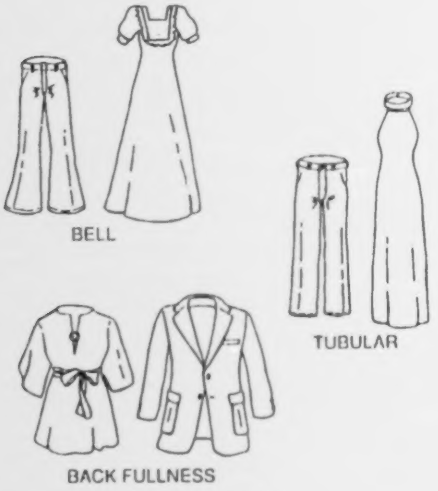


Figure 7.4

The shape that is desirable for others to see can be created through illusions in silhouette. To do this, first select an attractive silhouette. Body proportions can be emphasized or not emphasized by the outline of a garment. How tall someone appears to others is affected by the silhouette created. If looking taller is the goal, choose a slim silhouette with distinctive vertical lines so that the height is emphasized through repetition of the vertical lines in an individual's figure. By contrast, the silhouette appears shorter and wider with horizontal body lines.

Space

Space is the background against which forms or shapes are seen. A space may be used to emphasize or camouflage physical characteristics. Space provides a relief from looking at a particular motif on a clothing design.

The space between patterns on a garment can help create an illusion of size. For example, a widely spaced print fabric may appear more like a solid fabric than a print with closely spaced patterns. The two prints create different illusions of body size. Pleasing space divisions will make a garment more attractive while poor use of space will detract from the overall appearance.

Texture

Texture is the surface quality of an object. Texture is a design element that can be felt as well as seen. Every fabric has its own texture whether it is rough, smooth, shiny, soft, or harsh. Texture is an important consideration in determining how a fabric should be used. Feeling an article is often as important as seeing it. Texture can be determined more accurately through touch than through sight. One imagines how an article feels by looking at it. Because appearance can be misleading, both touch and sight are used to identify the true texture of an object.

Today, fabrics are available in many different textures and a variety of designs or patterns. The fiber(s) used to make fabrics influence the textures of the fabrics. Silk fibers may give fabric a smooth, shiny texture. The methods used to construct fabrics also affect their textures. Variations in weaving and knitting can create ridges in fabric or make them smooth, fuzzy, or shiny. Fabric finishes also affect the textures of fabrics by making them soft, smooth, shiny, or crisp or by giving them other characteristics. Rough and dull textures are usually used to create informal or casual garments. Smooth or fine textures usually suggest formality or elegance.

Texture greatly affects the appearance of color. Fabrics of different textures such as tweed and satin that are dyed an identical color may not appear to be the same color. A rough fabric such as tweed will absorb light. The fabric's unevenness creates shadows making it appear darker than a satin which is smooth and reflective. These factors are important to consider when trying to match colors in different textures.

As with line, fabric texture affects a person's appearance. Thick, shaggy, fuzzy, or wrinkled textures seem to add to body size because bulkiness is created. Sleek, glossy, or shiny textures tend to increase apparent body size because a shiny surface reflects more light than a dull surface. In contrast, smooth, dull textures seem to decrease body size because these textures reflect less light than glossy textures.

The age and personality of the wearer, the size and shape of the figure, the design of a garment, and the use and care of fabric all determine the choice of texture for a garment. Fashion designers, salespeople, and custom sewers must all be familiar with the effects that textiles have on a person's appearance in order to design or to assist customers in making good clothing choices.

Glossy textures, as seen in satin fabric, emphasize figure defects and a poor complexion. A heavy person may choose to avoid clothing that is made from fabrics such as satin. In addition, satin is likely to overpower the small, slender figure. Heavy or bulky textures are suitable for the person with an average figure and height. Heavy, bulky textures overpower the small, slender figure and add bulk to the short, heavy figure. Bulky textures are best for use in making garments with designs having few seams, for sportswear, and for men's and women's coats.

Stiff textures tend to stand out from the figure. Some styles that use stiff textures may conceal large thighs and hips if the figure is otherwise well-proportioned. Stiff textures as seen in taffeta fabric are better for slim, youthful figures than for older or heavy figure types. Sheer textures such as voile and chiffon fabrics cling and reveal the figure. They are not as revealing if they are used over taffeta linings. Sheer fabrics are most frequently used to construct women's apparel such as full skirts, draped blouses, and draped skirts. Smooth soft textures such as crepes and wool fabrics, manufactured fibers, soft linen, percale, poplin, and silk are suitable for almost any figure type.

There are a few set rules and regulations for combining textures. Generally, textures combined in a design should be related or should contrast pleasantly. Textures that can be combined successfully are considered to be natural companions whereas other textures, such as denim and chiffon, seem to clash. The combined textures should express harmony by being suited to each other and to their intended uses. Practice in combining textures and observing textures that go well together will help the understanding of and use of the element of texture. One helpful guideline is that usually no more than two textures should be combined in a single garment.

Color

A person with normal vision can discriminate at least 2,000 colors. Color is one of the most important elements in apparel design because of its effects on people, garments, and accessories. People react emotionally and physically to the colors around them. Colors can be irritating, disturbing, restful, soothing, stimulating, or exciting.

Color is the aspect of clothing that is most often noted and remembered, followed by shape/form. The color and form of a garment interact together. This interaction between colors and forms is visual. The visual perception of a garment is an evaluation of what the observer's eyes record. The designer influences the observer's reaction, impression, and satisfaction by the forms and colors selected for a garment.

A person enjoys the element of color immediately upon seeing a garment. Use of color can emphasize an area of the body or draw attention away from it. Contrasting colors can emphasize an area while related colors can hide the area. No one color is ever completely isolated from all others.

A color wheel is helpful in selecting and coordinating colors. The ***color wheel*** is a diagram used to show characteristics of colors, to create different colors, and to develop color schemes or color plans. Primary, secondary, and tertiary are names given to the colors on the most common color wheel that includes twelve colors. The basic color wheel can be expanded to twenty-four colors showing the primary, secondary, intermediate, and the quaternary colors. Colors in a color wheel are arranged in a circle to show how they relate to each other. The ***primary colors*** are red, yellow, and blue. These three colors cannot be made by mixing other colors together. ***Secondary colors*** are made by mixing equal parts of any two primary colors. The secondary colors are violet, green, and orange.

Figure 7.5 shows a basic color wheel including twelve colors.

Basic Color Wheel

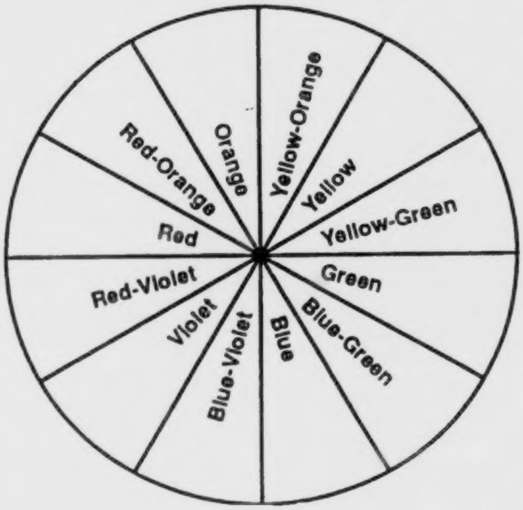


Figure 7.5

The ***tertiary colors***, or ***intermediate colors***, are those between the secondary and primary colors on the color wheel. The intermediate colors play an essential role in color harmonies. Designers and artists use more intermediate colors and other color mixtures than the primary and secondary colors. Each intermediate color is made by mixing one primary color and one secondary color that are next to each other on the color wheel. The name of the tertiary color includes both the primary and secondary color names with the primary name stated first. Names of the tertiary colors are yellow-green, blue-green, blue-violet, red-violet, red-orange, and yellow-orange. The ***quaternary*** colors are formed by mixing primary and intermediate or intermediate and secondary colors.

Color has three descriptive properties called hue, value, and intensity. ***Hue*** refers to the basic color identity or the specific name of a color, such as red, blue, or green. Each color on the color wheel is a hue. The term hue does not imply color purity. The same hue may have many different commercial names. The colors such as Terra Cotta, Cobalt Blue, Persimmon, and Emerald Green are commercial names of colors. New color names are introduced every season in the fashion industry. These names change with fashion seasons but are used to refer to standards on the color wheel that never change.

Value refers to the lightness or darkness of a color in relation to black and white. Value of a color depends on the amount of light the color reflects. The basic hue or middle value of a color is what appears on the color wheel. When white is added to a color, the result is a ***tint***. A ***shade*** results when black is added to a color. When white is mixed with a color, the color is lightened by making it more reflective. Adding black will darken a color's value by making it less reflective. ***Tones*** are formed by adding both black and white to a hue. A tone can also be formed by adding some of the color's direct complement.

Intensity refers to the degree of brightness, dullness, strength, or weakness of a color. Intensity describes the degree of purity or strength of a color. Intense colors are bright and clear and are stimulating. They make objects appear larger and closer. They also call attention to form. Less intense colors are dull and grayed. They create a calmer effect than intense colors. Less intense colors make objects seem small and far away. In combining colors, one should consider the hue, value, and intensity of the colors used in a color combination. Any colors can be combined with pleasing results if they are of the right value and intensity.

When two or more colors are combined they can be classified as similar or related color harmonies and contrasting color harmonies. Similar color harmonies include monochromatic and analogous color schemes. Contrasting color harmonies include accented-neutral, complementary, split complementary, and triad color schemes.

Figure 7.6 shows illustrations of several basic color schemes.

Basic Color Schemes

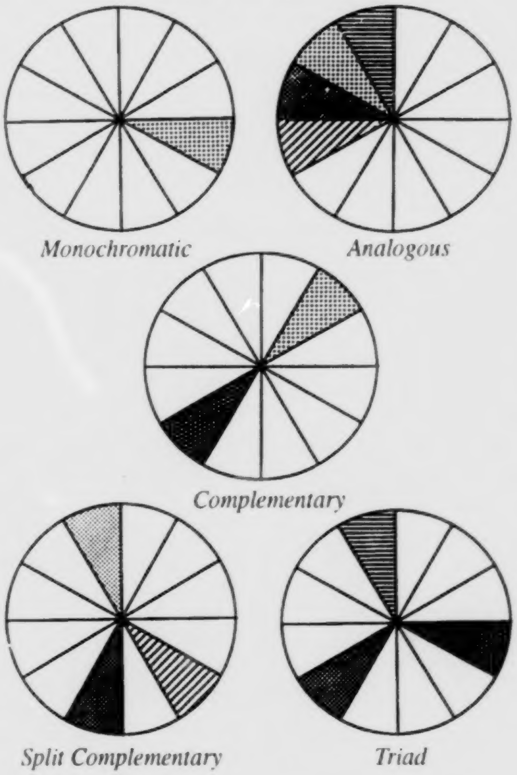


Figure 7.6

A ***monochromatic*** color scheme contains two or more variations of the same hue. It includes various tints, shades, and intensities of one color. Unity is a characteristic of a monochromatic scheme.

An ***analogous*** color scheme involves use of colors that are adjacent on the color wheel. There should not be fewer than three or more than six colors in this scheme. Analogous color schemes usually look best when one color is dominant and the other colors are used in smaller amounts to add interest.

Complementary color schemes involve use of colors that are direct opposites of each other on the color wheel. Red and green are examples of complementary colors. Complementary colors make each other look more intense and brighter when used together. Generally, one color is dominate and various values and intensities are used to lessen the contrast.

A ***split complementary*** color scheme uses one color with the two colors on either side of its direct complement. Orange, blue-green, and blue-violet provide one example of a split complementary color scheme. Split complementary color schemes are often used in plaid fabrics. A ***double complementary*** color scheme uses two complementary schemes together. Any combination of pairs may be used as long as each is composed of complementary colors. An example is the combination of yellow, violet, green, and red.

Triad color schemes involve the use of hues that are four steps apart and equidistant from each other on the color wheel. Red, yellow, and blue form a triad color scheme. ***Accented neutral*** color schemes are made by using black, white, or gray with a small amount of a bright color accent. A white dress with a red belt shows an example of an accented neutral color scheme.

The psychological effect of color is an important consideration in color selection. Moods and personalities are reflected and influenced by the use of color. In addition, color is important in complementing positive body characteristics and minimizing negative traits. ***Cool colors*** include blue, green, and purple. They are associated with grass, trees, and water. Cool colors give a feeling of restfulness. They are also known as the receding colors. Dark, cool colors tend to make a figure look smaller.

Warm colors include red, yellow, and orange. They are associated with warm objects such as fire and the sun and give a feeling of activity and movement. The warm colors are also known as advancing colors because they can make objects appear closer or larger than they really are. Warm colors, especially when used in strong intensities, make a person appear larger.

Brilliant color contrasts result when certain hues are used with any of the primary neutrals. The ***primary neutrals*** are white, gray, and black. White provides the purest contrast of the neutrals. White is the absence of all color. Any color that is presented against white stands out with color purity. Black represents the presence of all color and delivers the greatest mood of the neutrals. Neutral colors tend to conceal body contour and slim the figure. Grays and other medium hues make a figure blend into the background.

◆ Essential Questions: Elements of Design ◆

1. What are the four types of lines? What different effects are produced by using each of these types of lines?
2. How do structural and decorative lines differ?
3. What is a silhouette? How are the basic silhouette types used to produce different effects and designs?
4. How does texture affect the color of a fabric? What are examples of different textures?
5. Which two elements of design are most often noted and remembered in regard to clothing?
6. How does understanding the color wheel benefit a person employed in the textile and apparel industries?
7. What are the differences between values, shades, and tones?

PRINCIPLES OF DESIGN

The parts that make up a design are called the elements of design. There are no rigid rules for combining the elements to create a design, but there are basic guidelines to follow. These guidelines are called the ***principles of design***. They are balance, proportion, rhythm, emphasis, and harmony/ unity. In good design, it is almost impossible to separate the elements and principles of design because they work together to create a total effect. The elements are the building blocks of design while the principles are the guidelines for combining the elements.

Balance

Balance is the principle of design that produces a sense of equality between opposite elements and of restfulness. The elements in a balanced design appear to be equally distributed on both sides of a central focal point. A balanced design produces composure because both sides have an equal pull on the observer's eyes. A design that is not balanced appears disturbing and unpleasant.

Each element and object in a design must contribute to creating balance. Color, form, texture, pattern, and lighting are examples of factors that produce balance. Balance, in turn, helps to create unity in a design. The two types of balance are formal and informal. Both types of balance can create pleasing designs. Formal and informal balance produce very different effects.

Formal balance, or ***symmetrical balance***, exists when a design is exactly the same on both sides of the design center. An example is a jacket with buttons down each side of the center and pockets of the same size and in the same place on both sides of the center. Formal balance gives an orderly feeling to a garment.

Informal balance, or ***asymmetrical balance***, is achieved by placing different, but equivalent, designs on either side of a central point. In other words, the design is visually balanced but is different on each side of the design center. An example of informal balance is a jacket with a side closing and one pocket. Arrangement of informal balance usually requires more thought and creativity than does creating a design using formal balance. Figure 7.7 shows four garments designed using formal and informal balance.

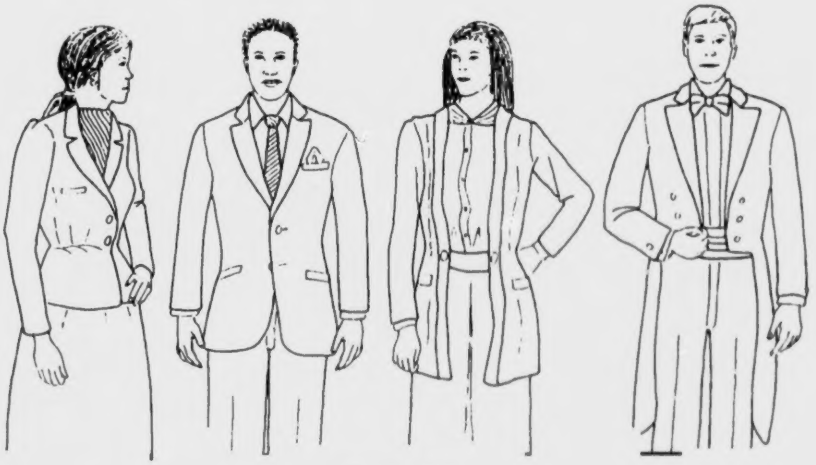


Figure 7.7

Proportion

Proportion refers to the relationship of parts to each other and to the whole based on the way space is divided. All space divisions should be pleasingly related to each other and to the design as a whole. All parts of the design look good together. Generally, uneven space divisions are more interesting than spaces divided equally.

The law of proportion, when applied to the size relations of objects used together, is called ***scale***. The terms scale and proportion are similar, and proportion cannot be discussed without referring to scale. Proportion deals with space relationships while scale refers to size relationships. Clothing should simulate ideal body proportions. For example, a long-waisted person may wish to choose garments that are not fitted at the waistline.

In fashion design, the principle of proportion can be understood by considering the length of a jacket in relation to the length of a pair of men's slacks or to a woman's skirt. Often, people shorten slacks or a skirt that is/are part of a suit without shortening the jacket. In some cases, the jacket may look out of proportion because the relationship of the parts to the whole has been changed. Shortening the jacket as well as the slacks usually returns proper proportion to the fashion.

Rhythm

Rhythm refers to the illusion of motion as the eye moves easily from one part of the design to another. Rhythm provides a sense of order and a quality of gracefulness. Connected, controlled movement creates rhythm.

Repetition may be used to create rhythm through repeating objects, colors, or fabrics in a design. For example, colors present in fabrics may be selected and repeated in accessories. In the structure of a garment, repetition of shapes may be used in several ways. Decorative stitching or trims may repeat some of the construction or structural lines. For example, the yoke of a man's western shirt may have decorative fringe or studded stars to add rhythm through repetition.

Rhythm created by ***gradation***, also called ***progression***, is accomplished by making gradual, successive changes in a design. Gradation or progression involves a series of similar objects ranging from small to large, large to small, thick to thin, or thin to thick. A variation in sizes of circles or thick and thin lines is an example of gradation or progression in design. Gradation may also be found in structural lines. A formal women's garment with many ruffles may have ruffles at varied widths to give a sense of rhythm to the garment.

Rhythm by ***transition*** is achieved through the use of continuous lines moving throughout a design. A continuous line causes the observer's eyes to move along the design in a rhythmical manner. Rhythm of line can enhance a garment or destroy the positive aspects of the garment. Unless breaking the rhythm is a carefully planned part of the design, such as a pocket with horizontal strips on a jacket with vertical stripes, interrupting rhythm can be upsetting to the eye.

Emphasis

Emphasis is created when attention is drawn to a certain part of a design. The center of interest dominates the design. It can be created by contrast in texture, color, and line or by use of unusual shapes, textures, and colors. A contrasting belt can be used to emphasize a small waist or jewelry can be used to emphasize hands and arms. Placement of buttons, contrasting trims, and monograms may be used for emphasis.

Repetition, as well as contrast, can create emphasis. A neckline that repeats the shape of the face will accent the face. A strong color in a print may be emphasized by repeating the color in a belt or scarf. Lines in a particular garment may become dominant if they are outlined with stitching or a decorative trim.

Typically, garments are designed with only one main focal point. When too many different textures, lines, or colors are presented, a design may have a cluttered look. In addition, emphasis in fashion design can be used to draw attention to a feature or to distract from a feature. If a person wishes to appear taller, a garment may be selected that has a focal point high on the body. This technique will draw the observer's eyes upward and give the illusion of height.

Harmony/Unity

Achieving harmony or unity is the final goal of any design. It is created when all parts of the garment fit together to create a pleasing, whole design. The garment and the body must appear to be well-suited for each other. Each part should help fulfill the design's purpose and add to its appearance.

Having a logical and orderly plan helps to achieve unity. The clothing design must have a center of interest that determines the overall character of the design. There must be sufficient emphasis on the center of interest in order to make its role as the center obvious. Repetition is also an integral part of a unified design.

Sizes, shapes, colors, textures, and ideas used to create a design must be related for unity to exist. Unity is necessary to create an integrated whole. Too much unity can cause monotony. A certain amount of variety is needed to create interest. Too much variety can cause disorder and destroy the unity of the design. Harmony results from a tasteful blending of balance, rhythm, emphasis, and proportion to produce a unified but interesting whole.

◆ Essential Questions: Principles of Design ◆

1. What are examples of monochromatic, analogous, split complementary, double complementary, and triad color schemes?
2. If the elements are the building blocks of design, what are the principles of design?
3. What are examples of the use of formal balance? informal balance?
4. How does proportion differ from scale?
5. What methods are used to create rhythm in a design?

Chapter Highlights

- Design refers to the organization or arrangement of parts that make up a structure or work of art.
- The elements of design are line, shape/form, space, texture, and color. The use of these elements in designing apparel should be flexible. They are meant to be interpreted within the current fashion trends and to enable the designer to solve a particular problem.
- Line is the element of design that indicates direction, length, width, and straightness. Lines are vertical, horizontal, diagonal, and curved. Lines may be structural (construction) or decorative.
- Lines are combined to create and define shape or form. Shape or form includes the silhouette formed by the outline of a clothing design. The three classic silhouettes are bell, tubular, and back fullness.
- Space is the background against which forms or shapes are seen. A space may be used to emphasize or camouflage physical characteristics.
- Texture is the surface quality of an object. Every fabric has its own texture whether it is rough, smooth, shiny, soft, or harsh. Texture is an important consideration in determining how a fabric should be used.
- Color is the aspect of clothing that is most often noted and remembered, followed by shape and form. The color and form of a garment interact together.
- One must consider the hues, values, and intensities of the colors used in a color combination. A color wheel is used to show characteristics of colors, to create different colors, and to develop color schemes or color plans.
- Primary, secondary, tertiary or intermediate, and quaternary colors are categories in which colors are grouped depending upon their location on the color wheel.
- The parts that make up a design are called the elements of design. There are no rigid rules for combining the elements to create a design, but there are basic guidelines to follow. These guidelines are called the principles of design.
- The principles of design are balance, proportion, rhythm, emphasis, and harmony/unity.

(Continued on page 110)

Chapter Highlights

(Continued from page 109)

- ☆ Balance is the principle of design that produces a sense of restfulness and equilibrium between opposite elements.
- ☆ Proportion refers to the relationship of parts to each other and to the whole based on the way space is divided.
- ☆ Rhythm refers to the illusion of motion as the eye moves easily from one part of the design to another. Rhythm can be created by repetition, gradation or progression, and transition.
- ☆ Emphasis is created when attention is drawn to a certain part of a design.
- ☆ Harmony or unity is the final goal of any design. Harmony results from a tasteful blending of balance, rhythm, emphasis, and proportion to produce a unified but interesting whole.

Chapter 8

Quality in Apparel and Accessories

Chapter Focus

The following Essential Knowledge and Skills are discussed in this chapter:

8G Determine textile and apparel labeling requirements.
8C Summarize social, cultural, societal, and generational influences that affect clothing and accessory trends and choices.

Chapter Vocabulary

accessories
consumer
consumer agencies
Consumer Bill of Rights
country of origin
customer
detachable labels
durability
first impression
Flammable Fabric Act
Fur Product Labeling Act
hangtag
image
label
needs
1972 Care Labeling Act
permanent labels
quality
Textile Fiber Product Identification Act
values
wants
Wool Product Labeling Act

There are several employment situations in which an individual may be required to assist customers or clients in assessing the quality of apparel and accessories. ***Accessories*** are items worn to enhance garments and create a complete outfit. Salespersons in retail stores often provide guidance to customers regarding clothing and accessory purchases. Salespersons in fabric stores and departments may be asked to assist customers in their selections. Personal shoppers select wardrobe items for clients and must be familiar with signs of quality. Custom sewers, tailors, and dressmakers often guide clients in the selection of fabrics and notions. Therefore, knowledge of quality in clothing and accessories is an important aspect of employment in the textile and apparel industries.

A ***customer*** is a person who purchases goods or services from a retailer. A ***consumer*** is the person who uses the goods or services. In order to assist customers and gain their trust, employees should understand signs of quality, care procedures, construction techniques, and principles and elements of design. Some customers select apparel and accessories wisely while others are unaware of factors to consider when making selections. These customers often need assistance from knowledgeable employees in order to make wise decisions.

SOCIAL INFLUENCES

The apparel and accessories an individual chooses are a result of a variety of influences. The image and first impression the person wants to project, personality, and lifestyle all influence apparel and accessory choices. Employees should assist customers in identifying the factors that influence their apparel and accessory choices.

An ***image*** is what people see and remember when they look at an individual. To project a positive image, individuals should have clean hair, body, teeth, and nails; maintain good health by eating properly and getting an adequate amount of exercise and rest; maintain good posture; display pleasant facial expressions and gestures; and wear clean clothing that fits properly and flatters the body. The image projected affects the first impression an individual makes. An employee should project this positive image to customers.

A ***first impression*** is the opinion a person forms when first meeting someone. First impressions are usually based on immediate feelings or reactions to a person's appearance and what he or she is wearing. First impressions are important in situations such as business meetings, customer relations, and social gatherings. Once a good first impression is made, it can be reinforced with positive actions and words.

Each person's personality is expressed through the apparel and accessories worn. Personality is made up of the characteristics that distinguish an individual, such as feelings, actions, and thoughts. The apparel and accessories individuals wear project how they see themselves and how others see them. Personality is sometimes judged on the apparel and accessories a person wears.

Lifestyle also affects the apparel and accessory choices an individual makes. Lifestyle refers to the activities in which a person is involved and the places she or he goes. Apparel and accessories should be appropriate for the type of lifestyle a person leads.

Values, Needs, and Wants

The quality people desire in ready-to-wear garments, accessories, and custom-sewn garments is impacted by individual values, needs, and wants. Employees should assist customers in determining their values, needs, and wants. ***Values*** are the ideas, beliefs, principles, and standards that are important to a person. ***Needs*** are essential items a person cannot do without. ***Wants*** are items desired to make life more enjoyable.

Employees should attempt to gain the following information from customers in order to assess their values, needs, and wants:

- What does the customer really need?
- What merchandise is available that will satisfy these needs?
- What are the differences in available merchandise?
- Which product best meets the customer's needs at the present time? in the future?
- Is the customer able and willing to pay the required price?
- What benefits will the customer receive once the merchandise is purchased?

Once a customer's values, needs, and wants are determined, an employee can assist in establishing the quality of merchandise that will satisfy the customer. The employee can then assist the customer in making wise purchases.

◆ Essential Questions: Social Influences ◆

1. How do image, first impression, personality, and lifestyle influence apparel and accessory choices?
2. How do values, needs, and wants affect the quality people desire in apparel and accessories?
3. How can an employee gain information about a customer's values, needs, and wants related to apparel and accessories?
4. How can an employee gain a customer's confidence, which helps motivate the customer to buy from the employee?

GUIDELINES TO QUALITY

When choosing apparel and accessories to purchase, a customer should check and compare the quality of items. ***Quality*** is the degree of excellence or superiority of an item. The quality of apparel and accessories can be high, medium, or low.

High quality apparel and accessories offer superior construction, materials, and design. Characteristics that also indicate items of high quality include straight seams; detailed construction; secure stitching and fasteners; emphasis on fabric, cut, and line; matched patterns at the seams; and coordinated linings.

Medium quality apparel and accessories are durable and offer reliable construction, materials, and design. Medium quality items are priced less than high quality items but more than low quality items. Low quality apparel and accessories may be poorly made and offer only fair construction, design, and materials. In addition, they may become worn and unflattering quickly.

Although high quality items are usually more expensive than medium or low quality items, quality is not always related to price. For example, high quality apparel and accessories may be on sale for a lower price, or they may be sold in a store with low operating costs. Therefore, low price is not always a sign of low quality. Furthermore, low quality items may be sold at higher prices. Sometimes prices are increased to help pay for high operating costs. Increased prices can also be the result of a special trim or logo. Employees should be aware of apparel and accessories of different levels of quality and be prepared to assist customers in selecting the levels of quality that will best satisfy their values, needs, and wants.

Evaluating Quality

When evaluating the quality of apparel and accessories, customers should check and compare appearance, care, comfort, and durability. Appearance is the way something looks. The appearance of apparel and accessories is affected by types of fibers and methods of fabric construction, design features and construction, and fabric finishes. Care is the upkeep required to maintain the appearance of apparel and accessories. Apparel and accessories that require special care, such as dry cleaning, may actually cost the customer more than minimum-care items. Minimum-care apparel and accessories do not require extensive care in order to maintain their appearances. In addition, minimum-care items usually do not require ironing, do not soil easily, and do not require special care.

The comfort of apparel and accessories is judged by the absence of undesirable features and by how well an item corresponds to climate and activity. Clothing that is too tight, irritating to the skin, or too warm is uncomfortable to wear. Durability refers to the

Apparel Quality Checklist

Buttonholes
√ correct size for buttons and buttons lie flat
√ equal in length
√ evenly spaced
√ lie flat

Buttons
√ attached securely
√ placement is correct distance from edge of garment
√ thread shank used if required
√ button and choice of thread compliment garment

Collars
√ corners are turned so points are sharp
√ sides are matched and balanced
√ trimmed corners lie smooth
√ understitched to hold collar flat

Cuffs
√ clipped and trimmed to prevent bulkiness
√ pointed or curved, both sides alike

Darts
√ tapered gradually to a point
√ point of dart tied or backstitched
√ pressed flat toward the center back, the center front, or down

Fabric
√ on grain
√ plaids or stripes match at seams
√ fiber content is appropriate for use of garment
√ fabric construction is appropriate for use of garment

Facings
√ seam clipped and trimmed to about 1/4 inch
√ seam is caught underneath the understitching
√ edges finished according to fabric type

Gathers, Tucks, Pleats
√ spaced evenly
√ folded evenly in width
√ pleats folded in correct direction for pattern

Grain Line
√ cut and stitched with grain straight
√ hangs well without twisting

Hems
√ correct stitch for fabric and garment
√ proper width for garment style
√ lie flat
√ not obvious from the outside of the garment
√ fullness distributed equally

Hooks and Eyes
√ hidden
√ attached securely
√ neat, even stitches

Interfacings
√ appropriate weight for fabric
√ used in places that need extra firmness

Linings
√ appropriate weight for fabric
√ constructed slightly smaller than outer fabric
√ attached to garment with swing tacks

Pockets
√ balanced evenly on garment
√ attached securely
√ pointed or curved, both sides alike

Seams
√ thread matches fabric
√ seam allowance appropriate for fabric and garment
√ finished seam allowance if necessary
√ smooth and free of puckers

Sleeves
√ ease distributed so there are no puckers
√ underarm seam matched with side seam
√ grain line from shoulder to elbow perpendicular to floor
√ sleeve set smoothly into armhole

Waistbands
√ width even from one end to the other
√ grain line straight at both ends
√ adequate overlap for fastener

Zippers
√ blend with garment
√ stitching is even and inconspicuous
√ work freely
√ inserted smoothly with no bumps or puckers

Table 8.1

Factors That Influence the Quality of Accessories

Accessory	Examples	Signs of Quality
Belts	leather belts plastic belts sashes self-belts	• material used is appropriate for intended function • closure functions well • closure allows adjustment of belt • eyelets (holes) are reinforced • eyelets are equal distance apart • stitched on-grain to avoid diagonal wrinkles
Eyewear	prescription glasses sunglasses	• sunglasses block ultraviolet rays • construction is sturdy • lenses are free from scratches • cases available to store eyewear • eyepieces fold easily
Footwear	boots sandals shoes	• material used is appropriate for intended function • method of construction is appropriate for material used • flaws do not appear in material used to construct item
Gloves	knit gloves leather gloves woven gloves	• lining material is appropriate for material of glove • provide adequate warmth and/or protection • construction is sturdy • material used is appropriate for intended function
Handbags	attaché cases envelope clutches tote bags	• material used is appropriate for intended function • method of construction is appropriate for intended function • straps or handles are securely attached • closure operates properly and is appropriate for design • closure matches quality of material
Headwear	berets felt hats knit caps visors	• material used is appropriate for intended function • method of construction is appropriate for intended function • adequately keeps head warm or cool
Hosiery	pantyhose socks stockings	• material used is appropriate for intended function • even coloration • free from holes, runs, snags, flaws • packaging protects hosiery from damage • well constructed • durable
Jewelry	earrings necklaces tie clasps watches	• clasp holds well and appears sturdy • good quality material used • free from flaws, scratches, dents, and missing parts • construction looks sturdy • items such as watches function as intended
Neckwear	bow ties neckties scarves	• material used is appropriate for intended function • method of construction is appropriate for intended function • fringe on scarves does not ravel • fabric for scarves drapes well • fabric does not wrinkle easily • fabric does not ravel

Table 8.2

ability to withstand hard wear or frequent use. When evaluating durability, customers should check characteristics such as design and construction, fiber content, fabric finishes, and colorfastness.

When evaluating the quality of apparel and accessories, employees and customers should consider the total appearance of items as well as specific features. Table 8.1 contains factors that influence the quality of apparel items in general, and table 8.2 contains factors that influence the quality of a variety of accessories.

◆ Essential Questions: Guidelines to Quality ◆

1. What distinguishes high quality, medium quality, and low quality apparel and accessories?
2. Why is the price of an item not always an accurate indication of the level of quality?
3. How do appearance, care, comfort, and durability affect the quality of apparel and accessories?

CONSUMER PROTECTION

To accurately evaluate the quality of apparel and accessories, customers and employees must understand other factors that influence the quality of textile and apparel products, such as regulations and consumer rights and responsibilities. In addition to encouraging better quality, textile and apparel regulations and consumer rights and responsibilities promote product safety, reliable service, and honest advertising. Employees should understand textile and apparel regulations and customer rights and responsibilities. They should also be able to explain them when necessary.

Textile & Apparel Labeling Regulations

Labels and Hangtags. A label is a piece of cloth or ribbon that is permanently attached to a garment and provides information about the garment. The federal government requires that almost all textile products sold in the United States contain labels providing information on fiber content, country of primary manufacture, identifying number of the producer or importer, and basic care instructions. The country of primary manufacture, called the ***country of origin***, refers to the country where the most significant amount of work to produce the product takes place.

The generic names of fibers must be included on labels rather than trademarks since many trademarks exist. Labels can also provide voluntary information such as trademark names of manufactured fibers, brand names of garments, information about the method of fabric construction, size of the garment, and names of special fabric finishes applied.

Permanent labels are usually stitched to garments at the back of the neckline or waistline or on a facing or side seam. As long as a label does not ravel, it may be of any style or color and information may be included on both sides if the label can be turned over. Examples of labels are shown in figure 8.1.

Some labels may be detachable. ***Detachable labels*** are intended to be removed from garments and are usually attached to garments by a plastic band, a string, a straight pin, or a staple. A ***hangtag*** is a detachable label made of heavy paper or cardboard. Hangtags are often hung from zippers, sleeves, underarm seams, buttons, buttonholes, or belt loops. Hangtags often include the same information found on labels. Much of the information included on hangtags is voluntary, such as information about special finishes, reinforced pockets, logos, guarantees, or seals of approval. Examples of hangtags are illustrated in figure 8.2.

100% ACRYLIC
Size 9/10
MADE IN TAIWAN
R.O.C.
RN 5298
CARE (OVER)

Front

Turn garment inside out and machine wash cold, delicate.
Hang to dry.
Do not dry clean.
Do not tumble dry.
Do not iron.

Back

RN 64039
MADE IN U.S.A.
50% POLYESTER
50% RAYON
PETITE
MACHINE WASH
COLD WATER
NORMAL CYCLE
NO CHLORINE
BLEACH
TUMBLE DRY LOW
USE COOL IRON
STYLE 5220P-65
M

L ***100% COTTON***
RN 81750
MACHINE WASH COLD/DO NOT
BLEACH/TUMBLE DRY LOW
MADE IN CANADA

Figure 8.1

1972 Care Labeling Act. The ***1972 Care Labeling Act*** requires all finished garments and fabric sold for making apparel to have attached labels describing procedures for regular garment maintenance. Labels must be durable and remain readable throughout the normal life of a garment. Items that do not require care labels include footwear, headwear, gloves, hosiery, items that are disposable, decorative or ornamental items, and sheer items.

A 1997 revision to labeling regulations now allows manufacturers to use care symbols instead of written instructions on labels. Fabric care symbols are depicted in figure 8.3. Additional information on the 1972 Care Labeling Act is included in Chapter Six.

Textile Fiber Product Identification Act. ***The Textile Fiber Product Identification Act***, passed in 1960 and amended subsequently, requires that each textile product carry a label listing the generic names of the fibers from which it is made. The generic fiber categories are established by the Federal Trade Commission. The FTC can add new generic categories as needed.

The listing of fibers must be in order of the percentage by weight of fibers present in the product. The fiber present in the largest amount is listed first followed in decreasing amounts by other fibers present. Fiber quantities of less than 5 percent must be labeled as "other fibers" unless they serve a specific purpose in the product. When fibers cannot be identified, their presence must be listed as "X percent of undetermined fiber content."

The law prohibits the use of misleading names that imply the presence of fibers not in a product. Labels must carry either the name, trademark, or registered identification number of the manufacturer or importer. All items covered under the law must be clearly and visibly labeled as to whether they are imported or produced in the United States.

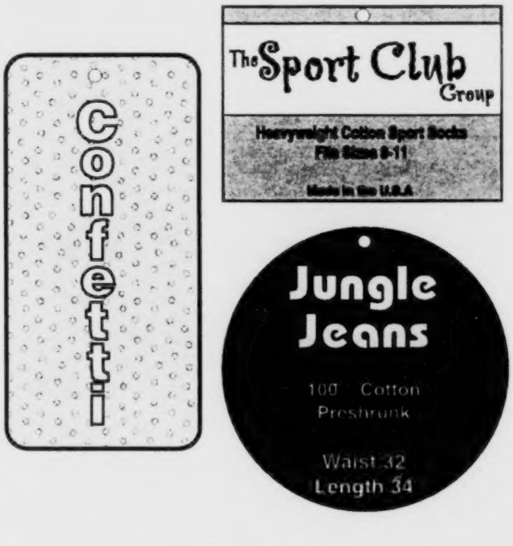


Figure 8.2

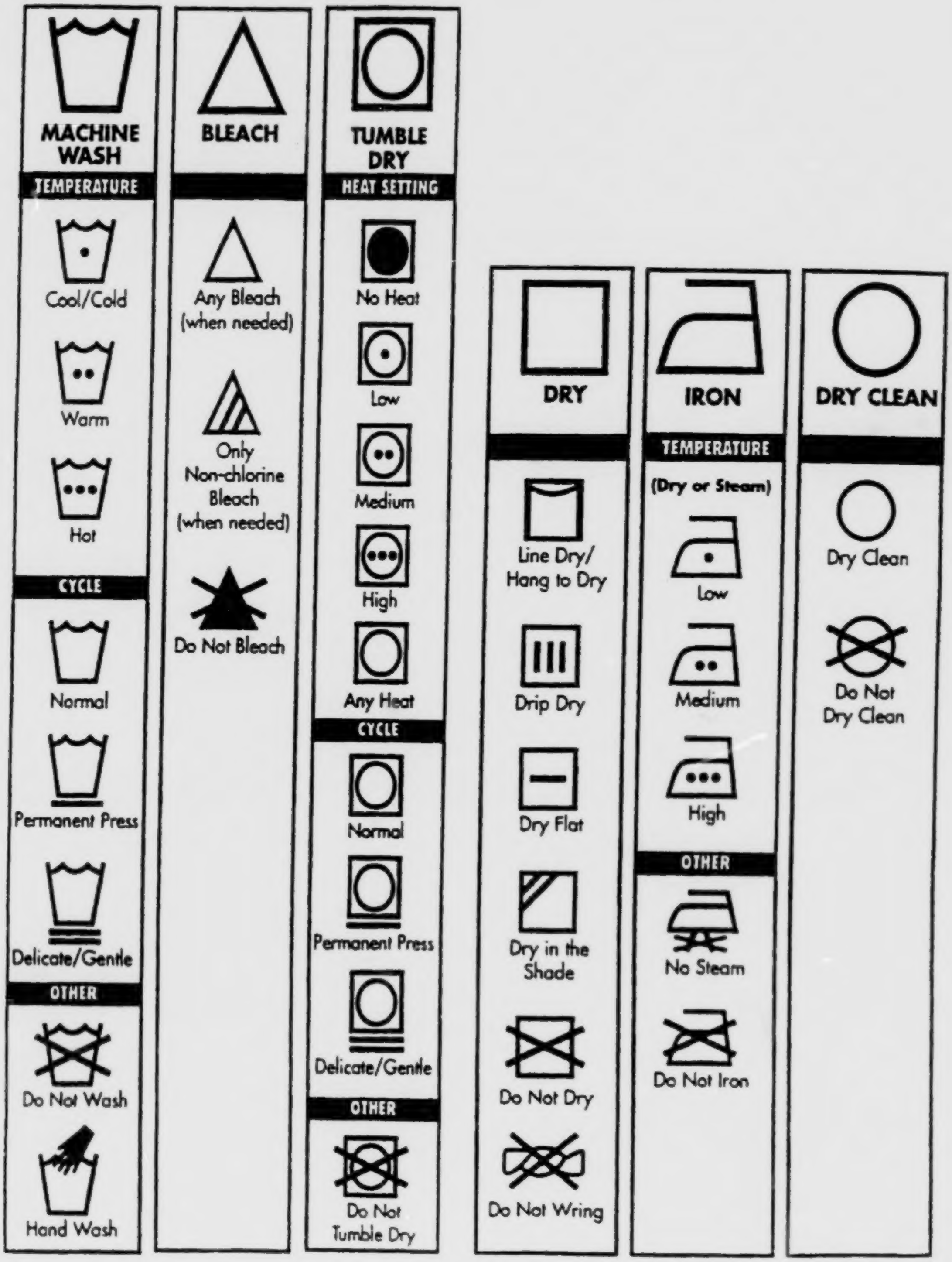

MACHINE WASH
TEMPERATURE
Cool/Cold
Warm
Hot
CYCLE
Normal
Permanent Press
Delicate/Gentle
OTHER
Do Not Wash
Hand Wash
BLEACH
Any Bleach (when needed)
Only Non-chlorine Bleach (when needed)
Do Not Bleach
TUMBLE DRY
HEAT SETTING
No Heat
Low
Medium
High
Any Heat
CYCLE
Normal
Permanent Press
Delicate/Gentle
OTHER
Do Not Tumble Dry
DRY
Line Dry/ Hang to Dry
Drip Dry
Dry Flat
Dry in the Shade
Do Not Dry
Do Not Wring
IRON
TEMPERATURE
(Dry or Steam)
Low
Medium
High
OTHER
No Steam
Do Not Iron
DRY CLEAN
Dry Clean
Do Not Dry Clean

Figure 8.3

Wool Product Labeling Act. The ***Wool Product Labeling Act***, passed in 1939, regulates the labeling of sheep's wool and other animal hair fibers. The Wool Product Labeling Act requires that all wool products be labeled and the fibers, except for ornamentation, be identified as either new or recycled wool. This act ensures the customer that he or she is purchasing a quality wool garment rather than a garment that resembles wool.

The law also states that the percentage of wool used in the face and the percentage of wool used in the backing of pile fabrics must be printed on the label. The contents of paddings, linings, and stuffings are listed separately from the face fabric content of products but must be listed on the same label. The origin of the wool (imported or domestic) must also be clearly printed on the label. Additional information on the Wool Product Labeling Act is included in Chapter Six.

Fur Product Labeling Act. ***The Fur Product Labeling Act***, passed in 1951, protects consumers from deceptive information on fur product labels and advertisements. The act requires the label of a fur product to list the name of the animal that produced the fur. In addition, information must be provided informing the customer if the fur has been bleached, dyed, or artificially colored in any other way. This act assures the customer that she or he is not purchasing a garment made from undesirable fur and sold under the name of higher quality fur.

The Fur Product Labeling Act also requires labels to contain information on the type of fur that is used in a garment, such as waste fur; fur from the ears, throats, paws, tails, or bellies of animals; and scrap pieces. The act also requires labels to list the country of origin of imported furs. The Fur Product Labeling Act requires that all fur products be labeled, even garments containing only a fur trim.

Flammable Fabric Act. The ***Flammable Fabric Act***, enacted in 1953, prohibits the sale of fabrics that burn faster, easier, and more intensely than other fabrics. The Flammable Fabric Act resulted in the development of standards for flame-retardant children's sleepwear and apparel. The act also resulted in flame-retardant household textile products such as mattresses, rugs, and upholstery fabrics. Enactment of the Flammable Fabric Act has led to the development of new fibers and finishes for production of flame-resistant fabrics.

Consumer Rights and Responsibilities

Customers have certain rights and privileges when making purchases. To make quality purchases, individuals should be aware of these rights and act responsibly. In 1962, President John F. Kennedy defined the rights of consumers. President Richard Nixon and President Gerald Ford each added one consumer right to the list. This list of consumer rights is referred to as the ***Consumer Bill of Rights***. These consumer rights have resulted in the passage of many textile and apparel laws such as the ones discussed in this chapter.

Employees are not responsible when customers make poor buying decisions. It is important, however, for employees to understand the rights of customers. Knowing that a customer has certain rights and being aware of those rights can enhance the customer/store relationship.

Consumer rights are accompanied by consumer responsibilities. In order to exercise their rights, customers should make an effort to act responsibly when shopping. For example, consumers have the right to be informed, but they also have the responsibility of analyzing the information they are given. Examples of consumer rights and responsibilities are included in table 8.3.

Consumer Rights	Consumer Responsibilities
The Right to Safety protection from goods and services that are dangerous	**The Responsibility to Use Products Safety** • Use items as they were intended to be used. • Follow recommended care and maintenance procedures. • Examine products for safety features. • Study care instructions before buying and using. • Study product safety ratings.
The Right to Be Informed protection from misleading and false information such as on labels and in advertisements	**The Responsibility to Use Information** • Locate information and compare and evaluate products before purchasing. • Analyze advertisements. • Look for recent developments and information on goods and services. • Understand performance claims. • Check use and care instructions before buying. • Seek information when existing information is inadequate.
The Right to Choose availability of a variety of good and services from which to choose	**The Responsibility to Choose Carefully** • Use buying power intelligently to encourage ethical business practices and reliable, safe products. • Be selective and resist pressure. • Recognize resource limitations. • Refuse products that waste resources. • Compare products before making purchases.
The Right to Be Heard right to speak out and be heard; assurance that interests can be expressed in legislative and judicial proceedings	**The Responsibility to Speak Out** • Express complaints and satisfactions through proper channels. • Suggest consumer legislation. • Suggest product improvements. • Know where to seek help. • Write to congressional representatives.
The Right to Redress assurance that problems will be corrected	**The Responsibility to Seek Redress** • Follow-up on problems until desired results are achieved. • Explain problems carefully and briefly. • State solutions to problems. • List the steps already taken to solve problems.
The Right to Consumer Education availability of consumer oriented educational resources such as reading material, classes, and seminars	**The Responsibility to Be an Educated Consumer** • Take advantage of consumer education classes and seminars. • Subscribe to and read consumer education related magazines. • Become informed on current consumer legislation.

Table 8.3

Consumer Agencies

Consumer agencies are organizations that enforce consumer legislation, such as textile and apparel laws, by investigating consumer problems and implementing rules and regulations that govern business activities. Agencies may operate locally, be funded by state and national programs, or be privately owned and operated.

Questions, comments, and complaints concerning most consumer products can be directed to organizations such as the following:

- **Better business bureaus.** Better business bureaus are non-profit organizations sponsored by private, local businesses. The services offered by better business bureaus vary from place to place and often include services such as general information on products or services, reliability reports, background information on local businesses and organizations, and records of complaint-handling performances. Many better business bureaus accept written complaints and will contact a firm on the behalf of the consumer.
- **Industry consumer programs.** Industry consumer programs are programs in which industry associations assist consumers with problems related to a specific industry. These associations are formed by individual businesses who join to assist with business problems and promote their industry. They usually offer consumer information and some handle complaints. Industry consumer programs include the American Apparel Manufacturers Association, the American Textile Manufacturers' Institute, and the National Association of Hosiery Manufacturers.
- **Consumer offices.** Consumer offices are familiar with local businesses and laws, and they help consumers resolve problems. There are consumer offices at the state, county, and city levels. When making a complaint, an individual should first contact the office nearest his or her home. It is recommended that complaints be submitted to the consumer office in writing. Consumer offices may be located in governors' offices, state attorney generals' offices, or mayors' offices.
- **Federal agencies.** Federal agencies are organizations associated with the government of the United States. Some federal agencies handle individual complaints while others take action for the benefit of the public as a whole. Many federal agencies also provide publications, fact sheets, and other helpful consumer information. Federal agencies include the Consumer Information Center, the Consumer Product Safety Commission, the Federal Trade Commission, and the Small Business Administration. Information regarding federal agencies can be obtained by calling the Federal Information Center (FIC).

◆ Essential Questions: Consumer Protection ◆

1. What information is found on textile product labels?
2. How do labels differ from hangtags?
3. What are five acts that regulate textile products? What is the purpose of each?
4. Why is it important for customers and employees to be aware of consumer rights and responsibilities?
5. What are four examples of consumer agencies that impact the quality of apparel and accessories? What role does each agency play?

Chapter Highlights

- Apparel and accessory choices are based on personality; lifestyle; desired image and first impression; and values, needs, and wants.
- Employees should be prepared to assist customers in selecting appropriate levels of quality.
- Factors that influence the quality of apparel and accessories include appearance, care, comfort, and durability.
- Textile and apparel regulations encourage higher quality apparel and accessories and promote product safety, reliable service, and honest advertising.
- Textile and apparel laws include the 1972 Care Labeling Act, the Textile Fiber Product Identification Act, the Wool Product Labeling Act, the Fur Product Labeling Act, and the Flammable Fabric Act.
- Individuals, as well as employees, should be aware of the rights and responsibilities of consumers and how they affect the quality of apparel and accessories.
- Consumer agencies such as better business bureaus, industry consumer programs, consumer offices, and federal agencies enforce consumer legislation by investigating consumer problems and governing business activities.

Chapter 9

Selecting and Coordinating Apparel and Accessories

Chapter Focus

The following Essential Knowledge and Skills are discussed in this chapter:

8A Describe factors considered when coordinating clothing and accessories.

8B Demonstrate coordination of clothing and accessories for various occasions.

Chapter Vocabulary

coordinate
hand
layette
weight

Read chapter sections for many additional terms related to specific styles of apparel for infants, women, and men.

Employees in the textile and apparel industries must often assist customers in selecting and coordinating apparel and accessories. Salespersons in retail stores often help customers combine apparel and choose accessories. Salespersons in fabric stores and departments may assist customers in selecting and coordinating fabrics and notions. Personal shoppers select and coordinate wardrobes for customers. Image consultants assist clients in assessing their wardrobes and making apparel and accessory selections.

In order to coordinate apparel and accessories effectively, it is necessary for employees to become familiar with factors such as uses of fabrics, combination of patterns, methods for matching colors, and complementary design features and styles. In addition, employees should be familiar with various clothing styles and types of apparel and accessories available for infants and children, women, and men.

APPAREL FOR INFANTS AND TODDLERS

Employees who sell apparel for infants and toddlers often assist parents, friends, and relatives in selecting clothing for children of different sizes and ages. Employees should assist customers in making selections that are durable, well-proportioned, and comfortable for children. To adequately assist customers, employees should understand the needs and the growth patterns of children and have a knowledge of the merchandise available.

Many children do not enjoy shopping for apparel and accessories. Therefore, employees should show sincere interest in children and attempt to make the shopping experience fun for both parents and children.

Some customers know what type of children's merchandise they want to purchase. These customers may tell a salesperson what items they want. Other customers, however, do not know what types of clothing are appropriate for children. When dealing with these customers, employees may need to ask questions to determine the customer's needs. Employees should attempt to find out each child's weight and measurements so the correct size can be selected.

Infants

Customers often find it difficult to purchase clothing for infants. Employees may assist a customer in determining what an infant needs, how long the infant will be able to wear specific items, and the correct size. Employees are often asked to assist customers in choosing a layette. A ***layette*** is a complete outfit for a newborn baby. A layette often consists of apparel, accessories, and bedding.

The main apparel items worn by infants include diapers, shirts, and sleepers. A variety of diapers are available for infants, including cloth and disposable diapers. Some diapers are prefolded while others may resemble pants.

Shirts, which cover only the upper part of the body, are designed to keep infants warm. Shirts usually slip on or have snaps. Shirts with snaps open down the front and are convenient since they do not have to be pulled over a baby's head. Shirts may be worn alone or under other clothing.

Since newborn babies sleep a great deal, they are frequently dressed in sleepwear. Sleepwear keeps babies warm while they are sleeping. Infant sleepwear includes a variety of styles such as the following:

- ***sleeper*** - a one-piece suit that covers a baby's feet. Sleepers are usually made of a stretch fabric and have raglan sleeves and snaps down the front, crotch, and legs for easy dressing.
- ***sleeping gown*** - a one-piece gown that has a drawstring bottom to enclose a baby's legs and feet. Sleeping gowns also have sleeves and may include cuffs that can be used to cover a baby's hands.
- ***kimono*** - similar to a sleeping gown, but with a closure at the neck and open at the bottom around the feet.
- ***two-piece sleeper*** - a pullover top and bottoms that snap together at the waist and sometimes down the crotch and legs.

Examples of sleepwear for infants are shown in figure 9.1.

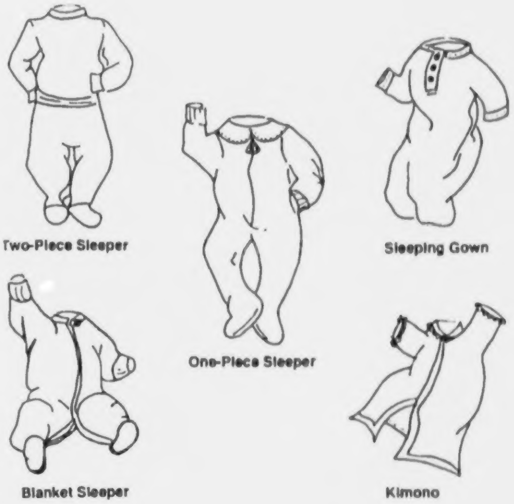


Figure 9.1

Toddlers

Since toddlers have different needs than infants, their clothing differs from infants' clothing. Toddlers' clothing is unique because it is designed to provide maximum movement and freedom needed by toddlers. Toddlers are learning to walk and are being toilet trained. Therefore, their clothing should not be baggy, and it should be easy to put on and remove.

A wider variety of clothing is available for toddlers than for infants. Clothing for toddlers includes the following:
- training pants rather than diapers
- undershirts for warmth
- sleepers with gripper feet
- pants with elasticized waists
- pullover shirts
- overalls with adjustable suspenders or adjustable straps that button on the waist
- sunsuits
- rompers
- dresses (for girls)
- pants and jacket (for boys)

Figure 9.2 includes examples of clothing appropriate for toddlers.

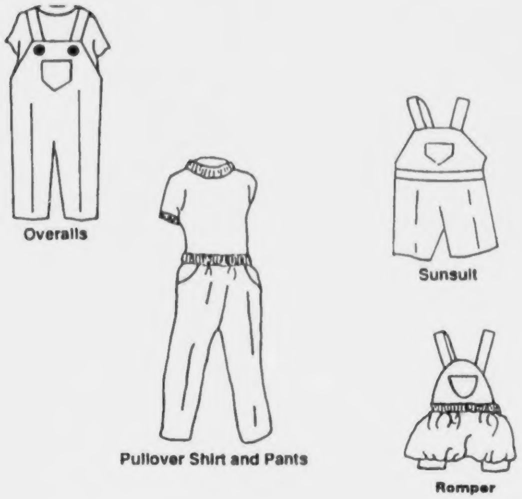


Figure 9.2

◆ Essential Questions: ◆ Apparel for Infants and Toddlers

1. What factors should be considered when helping customers select apparel for infants and toddlers?
2. In what ways can an employee assist a customer in selecting infant apparel?
3. How does clothing for toddlers differ from clothing for infants?

WOMEN'S APPAREL

Even though women's fashion styles continually change, there are basic garment styles and parts that remain the same. To effectively coordinate women's apparel and accessories, employees must be familiar with basic garment styles and parts. Garments such as blouses, skirts, dresses, and coats may be modified, but they usually retain elements of basic styles.

Blouses

A ***blouse*** is a loose garment worn on the upper part of the body. Blouses, which are similar to shirts, are worn by women and children. The style of a blouse is usually characterized by particular features of the blouse, such as the sleeve, neckline, and collar.

Sleeves. Sleeves are usually set-in, kimono, or raglan. Sleeves range in length from short to wrist length. Set-in sleeves are very common. ***Set-in sleeves*** are joined to a garment at the armhole. Therefore, all garments with set-in sleeves have a seam around the armhole (armseye seam). When constructed correctly, set-in sleeves allow for free arm movement. Set-in sleeves are constructed in a variety of styles. Examples of set-in sleeves are shown in figure 9.3.

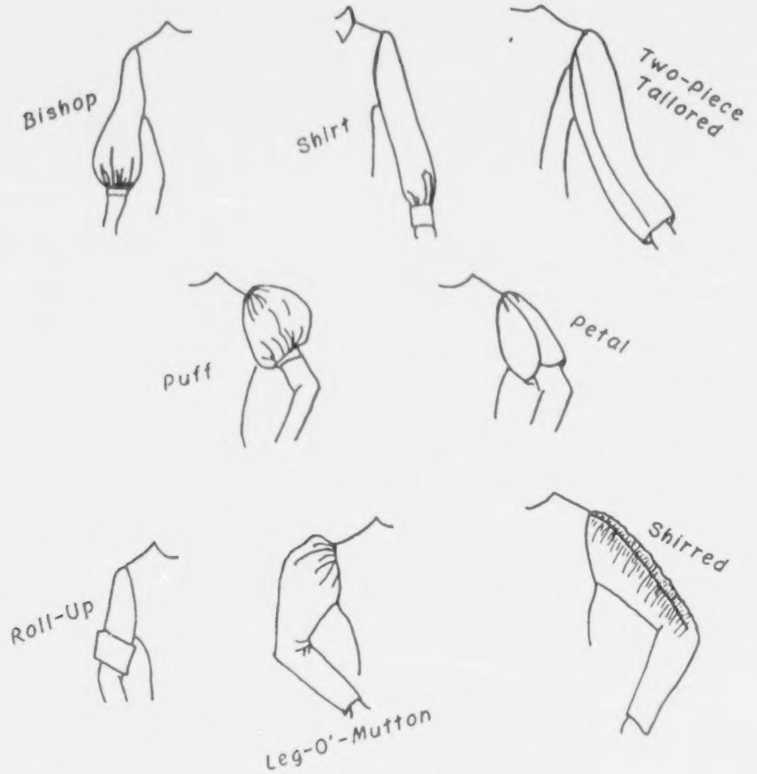


Figure 9.3

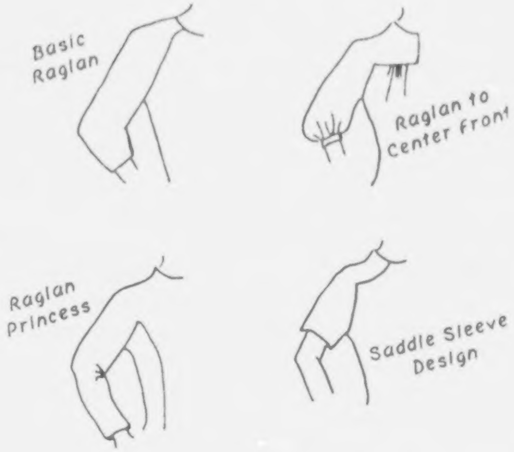


Figure 9.4

Raglan sleeves are attached to the bodice by a seam that continues in one piece to the collar. Raglan sleeves do not have seams at the shoulder. The seam of a raglan sleeve may extend to the neckline, or it may form a design on the bodice. Figure 9.4 illustrates examples of raglan sleeves.

Kimono sleeves do not have seams to connect them to the bodice. The bodice and the kimono sleeve are cut in one piece during construction. Some kimono sleeves may have a diamond-shaped piece of fabric called a gusset added to the underarm to provide freer movement. Variations in the kimono sleeve include the dolman sleeve and the batwing sleeve. A ***dolman sleeve*** is a kimono sleeve that is lower than usual at the underarm. A ***batwing sleeve*** is loose and very low at the underarm. Figure 9.5 shows examples of kimono sleeves.

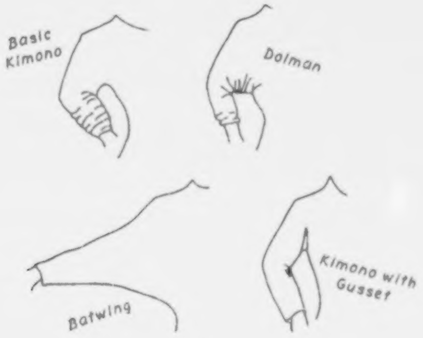


Figure 9.5

Collars. A ***collar*** is a piece of fabric attached to the neckline of a garment. A collar serves as a frame for the face and directs attention toward the face. Collars may be narrow or wide and may stand up around the neck or lie flat on a garment. Collars come in a variety of styles including those illustrated in figure 9.6.

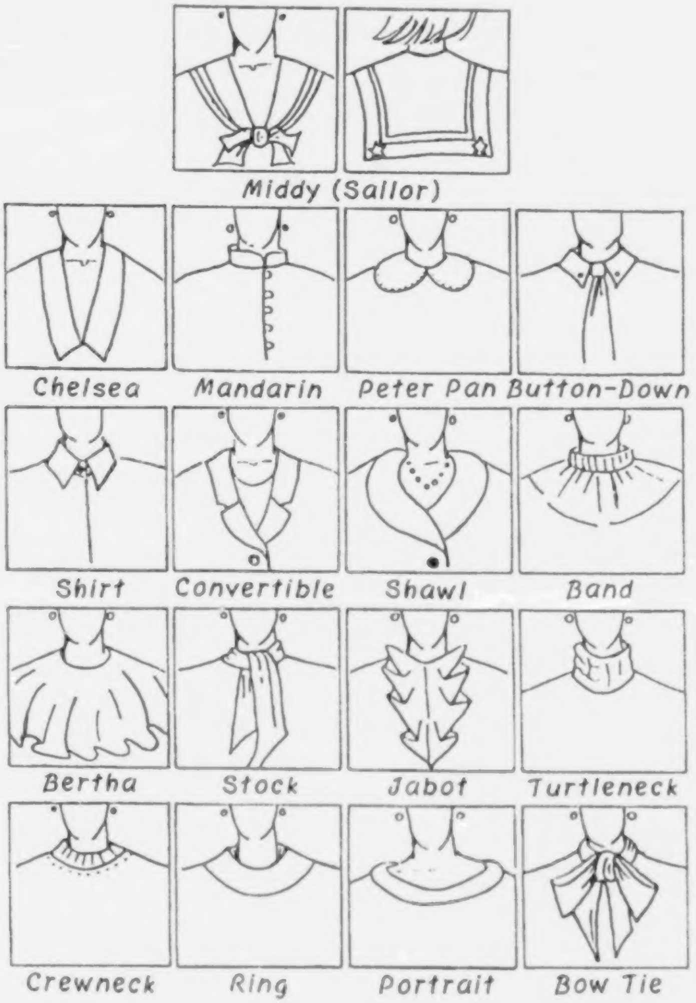


Figure 9.6

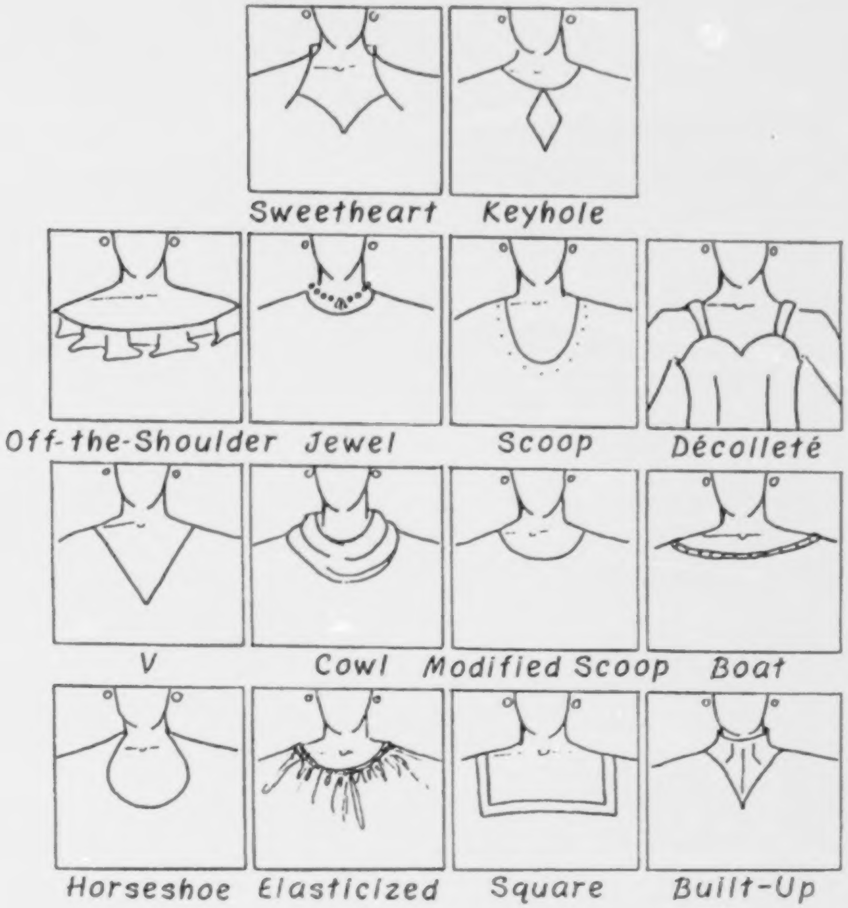


Figure 9.7

Necklines. A ***neckline*** is the line formed around or near the neck by the edge of a garment. It is not necessary for a neckline to be finished by a collar. There are a variety of neckline shapes and variations including the following:

- high in the back and low in the front
- high in the front and low in the back
- low in the front and the back
- high in the front and the back
- off the shoulder
- shaped (such as square and round)

Figure 9.7 contains examples of neckline styles.

Skirts

A ***skirt*** is a garment that hangs down from the waist. Skirts come in a variety of lengths ranging from micro mini (very short) to floor length. Women's skirt styles include the following:

- ***A-line skirt*** - fits close at the waist and flares at the hem
- ***circular skirt*** - is full at the hem and forms a circle when laid flat
- ***dirndl skirt*** - is reasonably straight with a gathered waist and some fullness in the skirt
- ***flared skirt*** - spreads outward toward the hem
- ***gathered skirt*** - is full at the waist
- ***gored skirt*** - has vertical seams extending from the waistline down to the hem
- ***pleated skirt*** - has folds of fabric extending from the waistline down to the hem
- ***straight skirt*** or ***fitted skirt*** - contains no added fullness and is straight from the waistline to the hem
- ***wrap skirt*** - wraps around the body and is secured by a tie or button

Figure 9.8 includes examples of women's skirts.

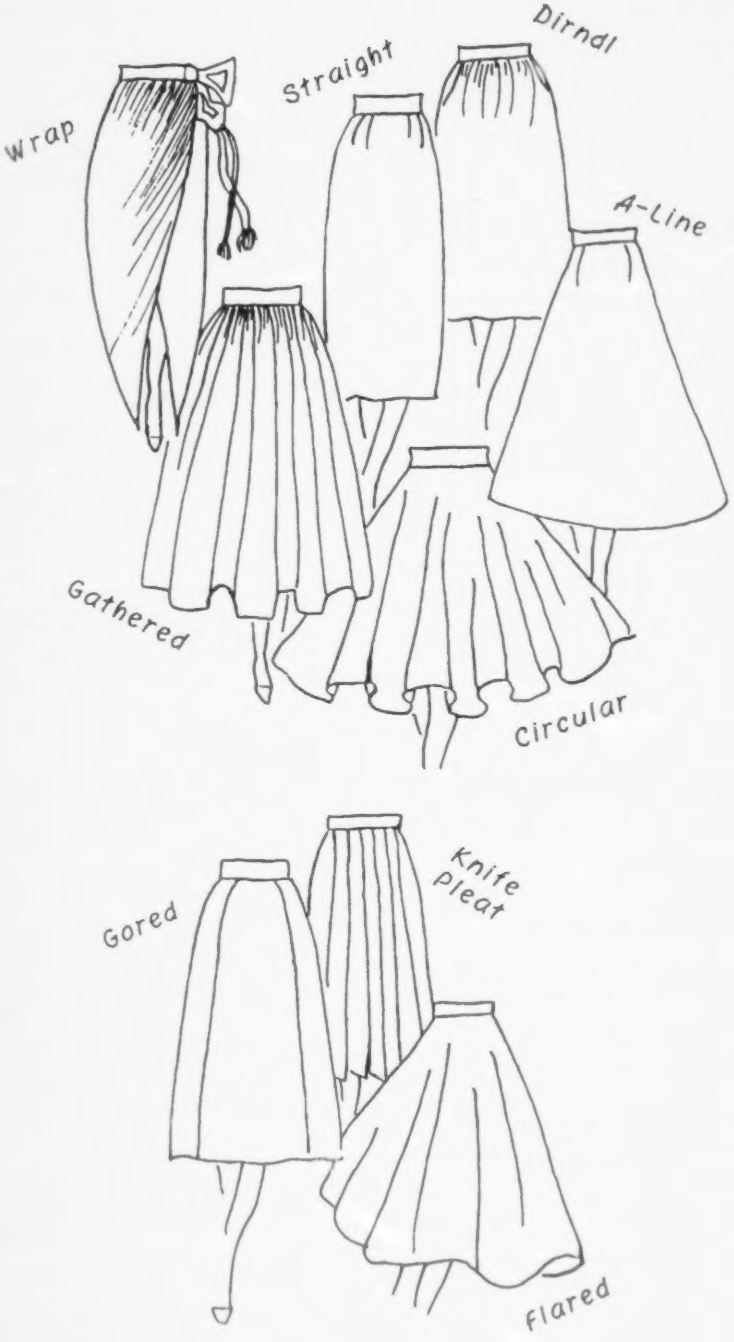


Figure 9.8

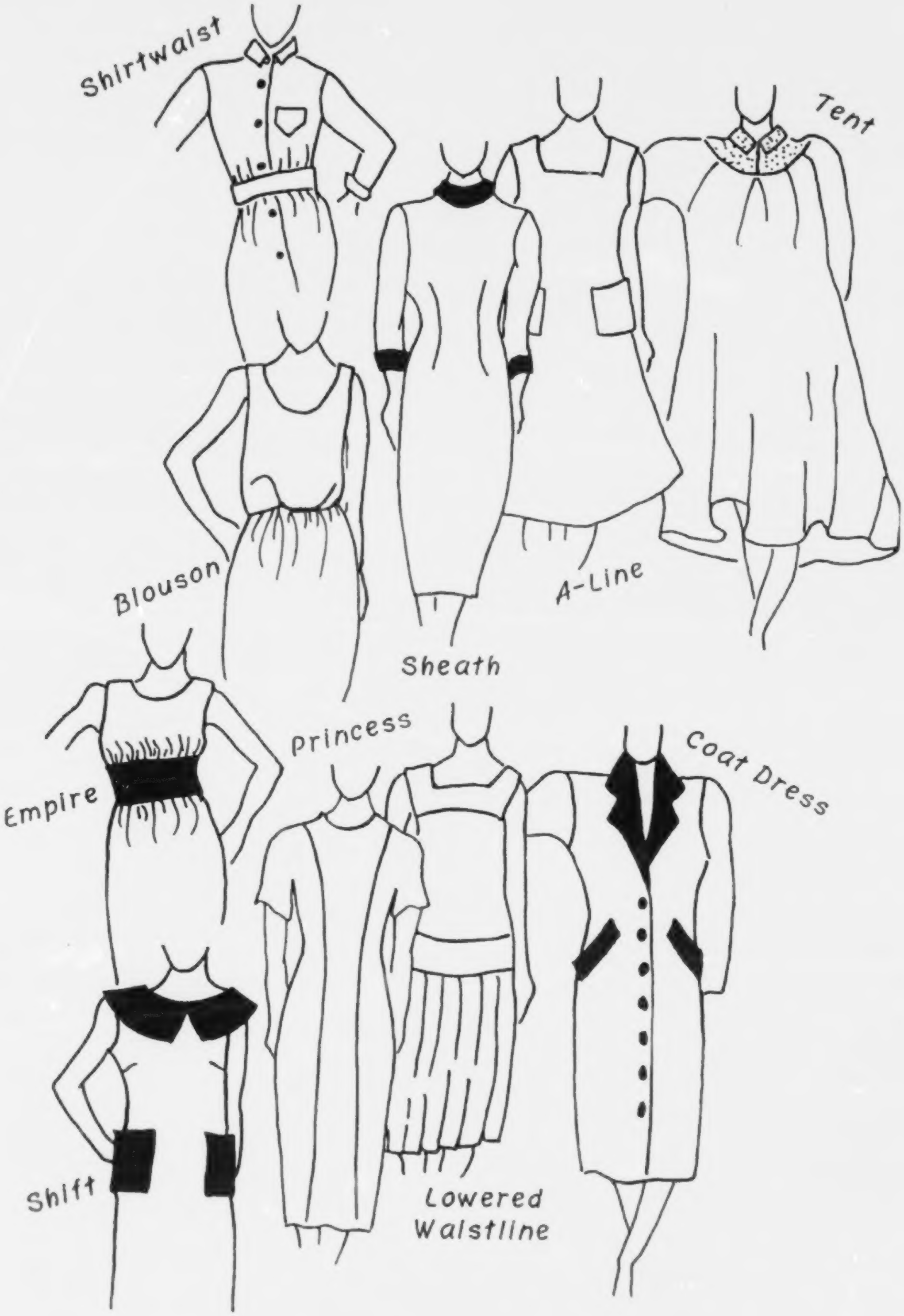

Shirtwaist
Tent
Blouson
A-Line
Sheath
Princess
Coat Dress
Empire
Shift
Lowered Waistline

Figure 9.9

Dresses

A ***dress*** is a woman's one-piece garment with a bodice and skirt. Women's dresses are available in a variety of basic styles and can range in length from micro mini (very short) to floor length. Women's dresses include the following basic styles:

- ***A-line dress*** - is fitted at the shoulders, has no waistline seam, and flares toward the hem
- ***blouson dress*** - has fullness above the waist, is belted, and has a fitted skirt
- ***coat dress*** - closes down the front and resembles a coat
- ***empire dress*** - has a high waistline and short torso
- ***lowered waistline dress*** - has a low waistline and a long torso
- ***princess dress*** - has vertical seams extending from the shoulder or armhole to the hem and is closefitting
- ***sheath dress*** - has no waistline seam and is shaped inward at the waist
- ***shift dress*** or ***chemise dress*** - has no waistline seam, fits loosely, and is not shaped inward at the waist
- ***shirtwaist dress*** - has a belt at the waist and resembles a long, tailored shirt
- ***tent dress*** - is large and flows loosely from the shoulders

Examples of women's dresses are shown in figure 9.9.

Coats and Jackets

A ***coat*** is a sleeved garment that opens down the front and provides warmth and protection. Coats are worn over clothing. The style of women's coats may be dressy or casual. Coats are often intended to be worn during a specific season such as winter or spring. Winter coats are usually made of a heavier fabric than spring coats.

Women's coat styles include the following:

- ***balmacaan coat*** - a loose coat with raglan sleeves
- ***capecoat*** or ***Inverness cloak*** - a coat with a cape over the sleeves
- ***chesterfield*** coat - a single-breasted coat that usually has a fly front and a velvet collar
- ***pea coat*** - a double-breasted, hip-length coat constructed of heavy woolen fabric
- ***princess*** coat - a closefitting coat with a flared skirt
- ***trench coat*** - a military style, belted raincoat that usually has shoulder straps
- ***wrap coat*** - a coat that wraps around the body and is secured by a belt

Examples of these coat styles are illustrated in figure 9.10

A ***jacket*** is a shorter version of a coat. Jackets differ from coats in that jackets are often worn to complement apparel rather than to provide warmth and protection. The style of women's jackets may be dressy or casual and heavy or lightweight.

Types of jacket styles include the following:

- ***bolero jacket*** - a waist-length jacket that is open at the front
- ***box jacket*** - a loosefitting jacket that hangs straight from the shoulders
- ***Chanel jacket*** - a single-breasted, collarless jacket usually having trim around the neckline, front, and lower edge
- ***Norfolk jacket*** - a single-breasted, loosefitting jacket with a belt, a pocket on each side, and box pleats on the front and back
- ***safari jacket*** - a belted jacket with two pleated pockets both above and below the belt
- ***windbreaker*** - a jacket with an elastic waistband and cuffs

Illustrations of these jacket styles are shown in figure 9.11.

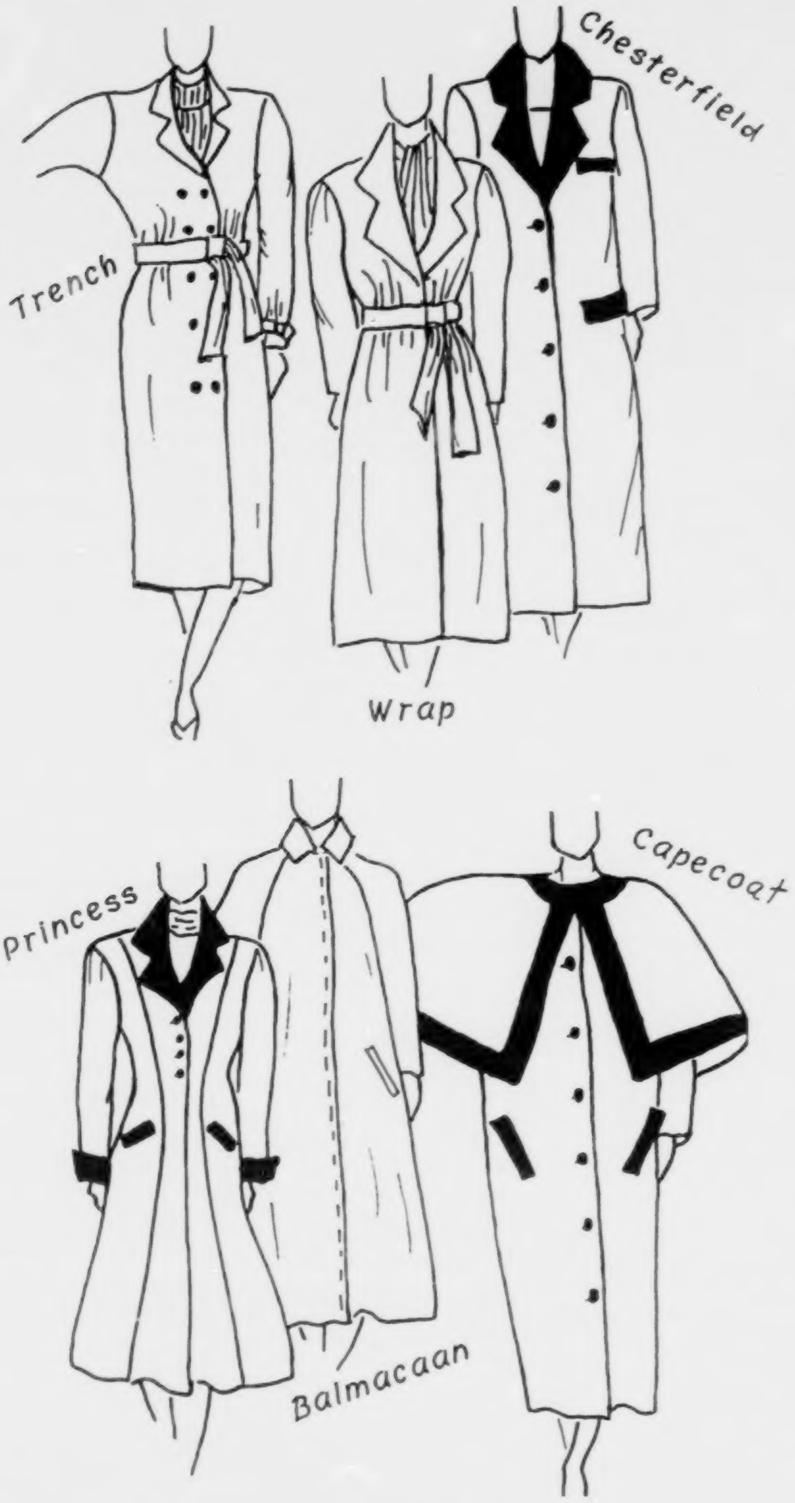


Figure 9.10

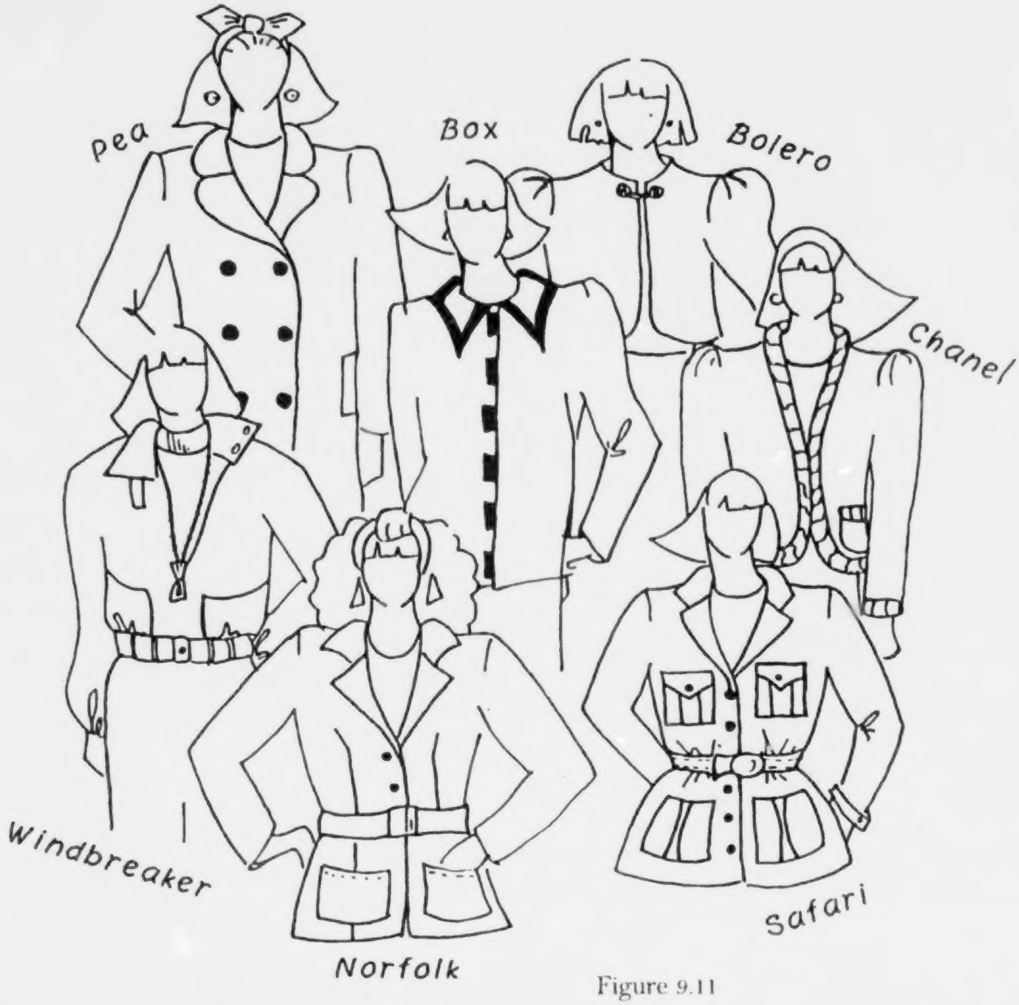


Figure 9.11

◆ Essential Questions: ◆ Women's Apparel

1. Why should employees be familiar with basic garment styles and parts?
2. How do set-in sleeves, raglan sleeves, and kimono sleeves differ?
3. What are the main differences in styles of women's skirts?
4. How do basic styles of women's dresses differ?
5. What characteristics distinguish the balmacaan coat, capecoat, chesterfield coat, princess coat, trench coat, and wrap coat?

MEN'S APPAREL

Employees should have a thorough understanding of the basic styles of menswear in order to effectively assist customers in coordinating apparel and accessories. Basic menswear items, such as shirts, are often modified to achieve a different look. However, menswear items can usually be identified according to basic styles. Men's apparel items easily identified by a particular style include suits, jackets, pants, shirts, and coats.

Suits, Jackets, and Pants

Suits. A ***suit*** is a set of garments intended to be worn together, such as jacket and pants. Men's suits are available in two-piece or three-piece styles. A ***two-piece suit*** consists of a jacket and pants. A ***three-piece suit*** consists of a jacket, pants, and a vest.

Men's suits may be American cut or European cut. The ***American cut*** suit has natural sloping shoulders, a loosefitting jacket, and moderately wide-notched lapels. The ***European cut*** suit has padded shoulders, tighter armholes, a jacket narrowed at the waist, and peaked lapels. Both styles may be single-breasted or double-breasted. Examples of the American cut and the European cut are shown in figure 9.12.

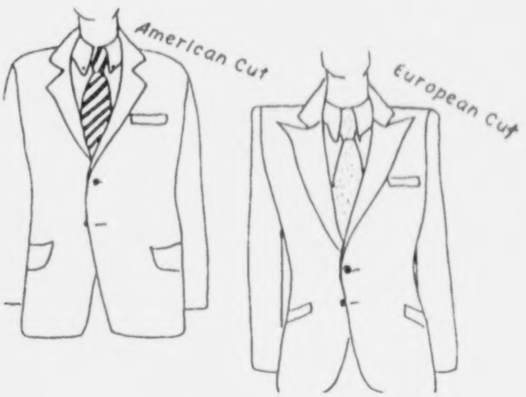
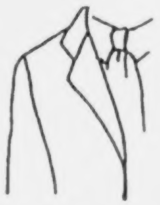


Figure 9.12

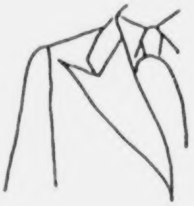
Jackets. A ***single-breasted*** jacket overlaps the front of the body and is fastened by a single row of buttons or one button. A ***double-breasted*** jacket overlaps the front of the body to provide a double thickness of material across the chest. Double-breasted jackets are fastened by a double row of buttons. Figure 9.13 includes examples of single-breasted and double-breasted jackets.

A ***sports jacket*** is a jacket that is more casual than a jacket worn with a suit. Sports jackets are usually worn with casual pants. Sports jackets have full shoulders, straight lines, and are loosefitting. In addition, they may have patch pockets. Two common types of sports jackets are the blazer and the single-breasted tweed jacket. A ***blazer*** is a lightweight, single-breasted sports jacket. Blazers are available in a variety of colors such as navy blue, kelly green, and red, and they often have silver or gold buttons.

The style of a jacket may be determined by the type of lapel. A ***lapel*** is the part of a jacket that folds back on the chest and forms a continuation of the collar. Two common types of lapels are the notch lapel and the peak lapel. The ***notch lapel*** is a standard business lapel. The notch lapel has a v-shaped indent where the collar meets the lapel. The ***peak lapel*** consists of two sharp points and it is more formal than the notch lapel. Peaked lapels are often included on double-breasted jackets.



Notch Lapel



Peak Lapel

Pants. ***Trousers*** are pants worn with a suit. Trousers are not usually worn for casual occasions. The details of trousers vary and may include a plain or pleated front, full-cut

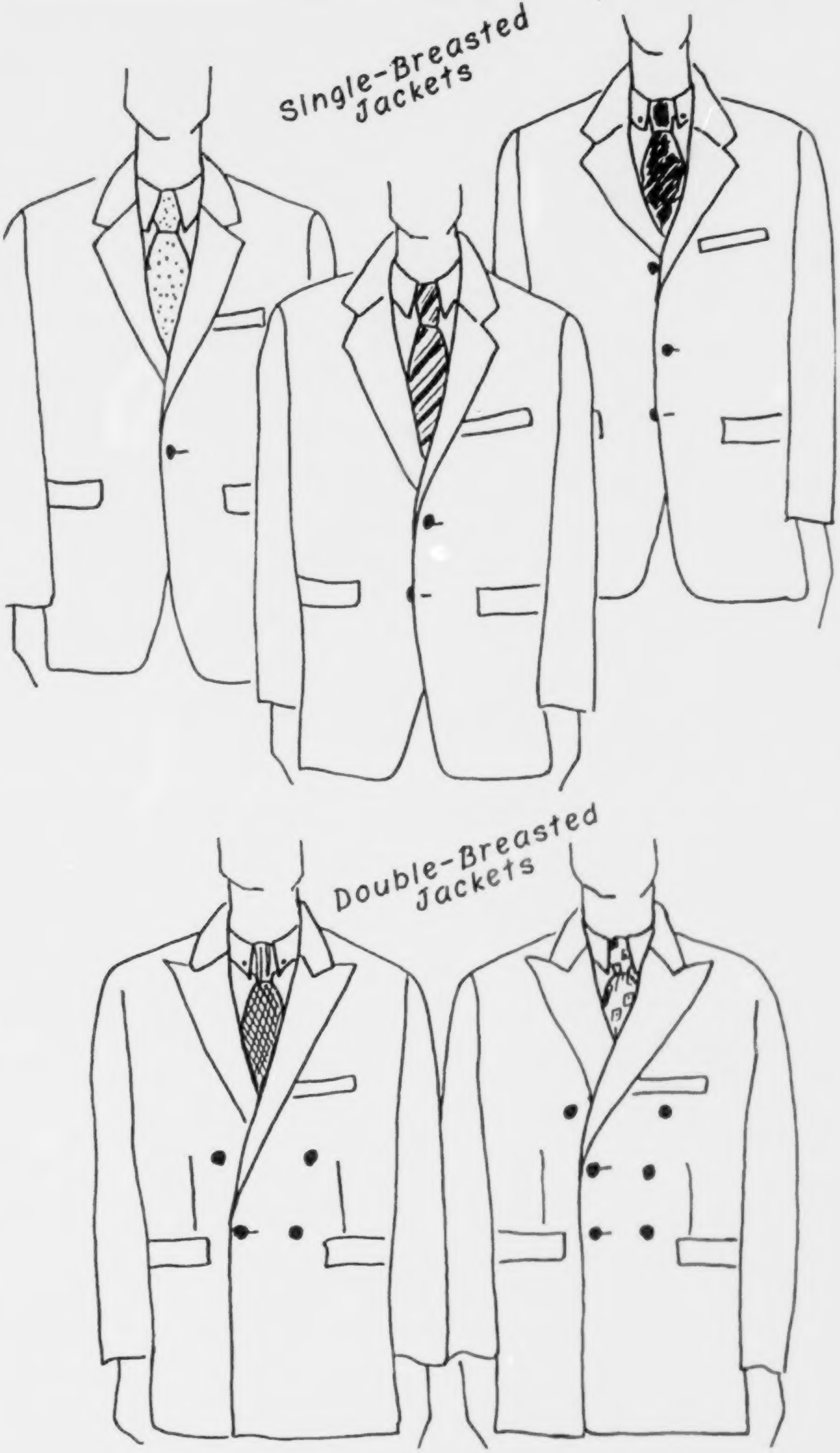


Figure 9.13

or slim-cut lines, tapered legs, self-waistband, extended waistband, or separate waistband. A ***self-waistband*** does not have belt loops and is designed to be worn without a belt. An ***extended waistband*** may be worn with or without a belt. A ***separate waistband*** has belt loops and is designed to be worn with a belt.

Slacks are pants that are often worn for casual occasions. Slacks may be traditional or continental style. ***Traditional slacks*** have belt loops and a waistband that is separately sewn. ***Continental slacks*** have a split waistband and no belt loops and often can be adjusted on the side of the waist.

Shirts

Men's shirts may be classified as work shirts, sport shirts, or dress shirts. A ***work shirt*** is intended to be worn when performing work requiring physical activity. A ***sport shirt*** is casual and is often made of knitted or woven materials. Sports shirts are often worn with slacks or jeans. A ***dress shirt*** is more formal and is intended to be worn with a suit.

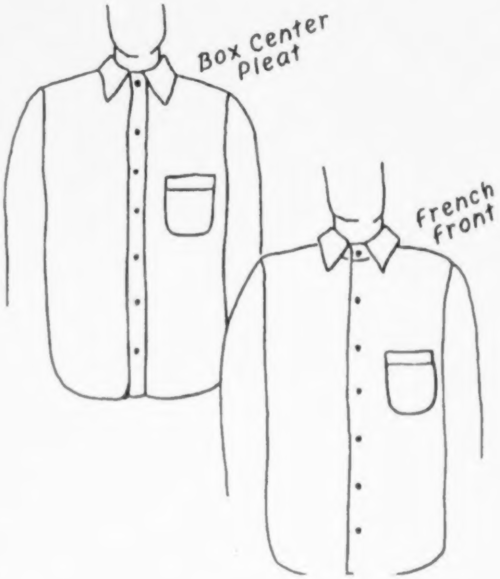


Figure 9.14

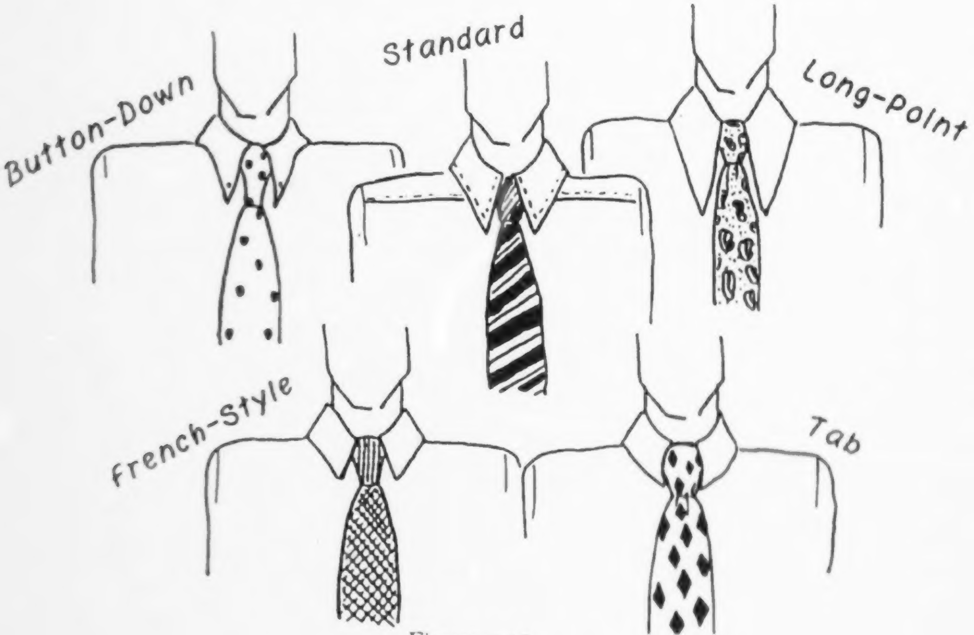


Figure 9.15

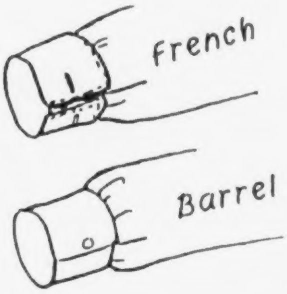
Dress shirts may be identified by the style of the front of the shirt. Shirt front styles include the French front and box center pleat. The ***French front*** has a plain, neat front facing. Extra material is stitched to the underside of the front piece to form the French front. The ***box center pleat*** has extra material stitched separately on top of the shirt front in a single line. The box center pleat is a more traditional style. Figure 9.14 shows examples of shirt front styles.

The style of a dress shirt is also influenced by features such as collar style and cuff style. Common styles of dress shirt collars include the following:

- ***button-down collar*** - buttons to the body of the shirt and has a soft, roll effect
- ***French-style collar*** - has short points and a large spread (the space between the tips of the collar)
- ***long-point collar*** - has a small spread and is 4" to 4 1/2" in length
- ***standard collar*** - is about 3" in length and is versatile
- ***tab collar*** - has snap tabs or a collar pin to hold the collar tips behind the tie knot

Figure 9.15 shows examples of these collar styles.

Common styles of cuffs include the barrel cuff and the French cuff. The ***barrel cuff*** is a traditional style of cuff that buttons. The ***French cuff*** is folded back and secured by cuff links rather than buttons.



Coats

A coat is worn over men's clothing to provide warmth and/or protection. Types of men's coats include the following:

- ***topcoat*** - lightweight, full-length coat generally worn during the fall and spring
- ***overcoat*** - heavy, full-length coat generally worn during cold weather
- ***all-weather coat*** - water-repellent coat with a zip-out lining so it can be worn during any season
- ***three-quarter length coat*** - shorter coat that is considered more casual

Men's coats are available in single-breasted and double-breasted styles with or without belts. Basic styles of men's coats include the following:

- ***balmacaan coat*** - a single breasted coat with full, raglan sleeves
- ***chesterfield coat*** - a single-breasted or double-breasted coat that usually has a fly front and sometimes a velvet collar
- ***trench coat*** - a military style belted raincoat that usually has shoulder straps
- ***ulster coat*** - a loose, heavy, long coat sometimes having a belt
- ***wrap coat*** - a coat that wraps around the body and is secured by a belt

Figure 9.16 shows examples of men's coats.

◆ Essential Questions: ◆ Men's Apparel

1. How do styles of men's jackets differ?
2. What are the three classifications of men's shirts? Describe each.
3. What are the four types of men's coats? Describe each.

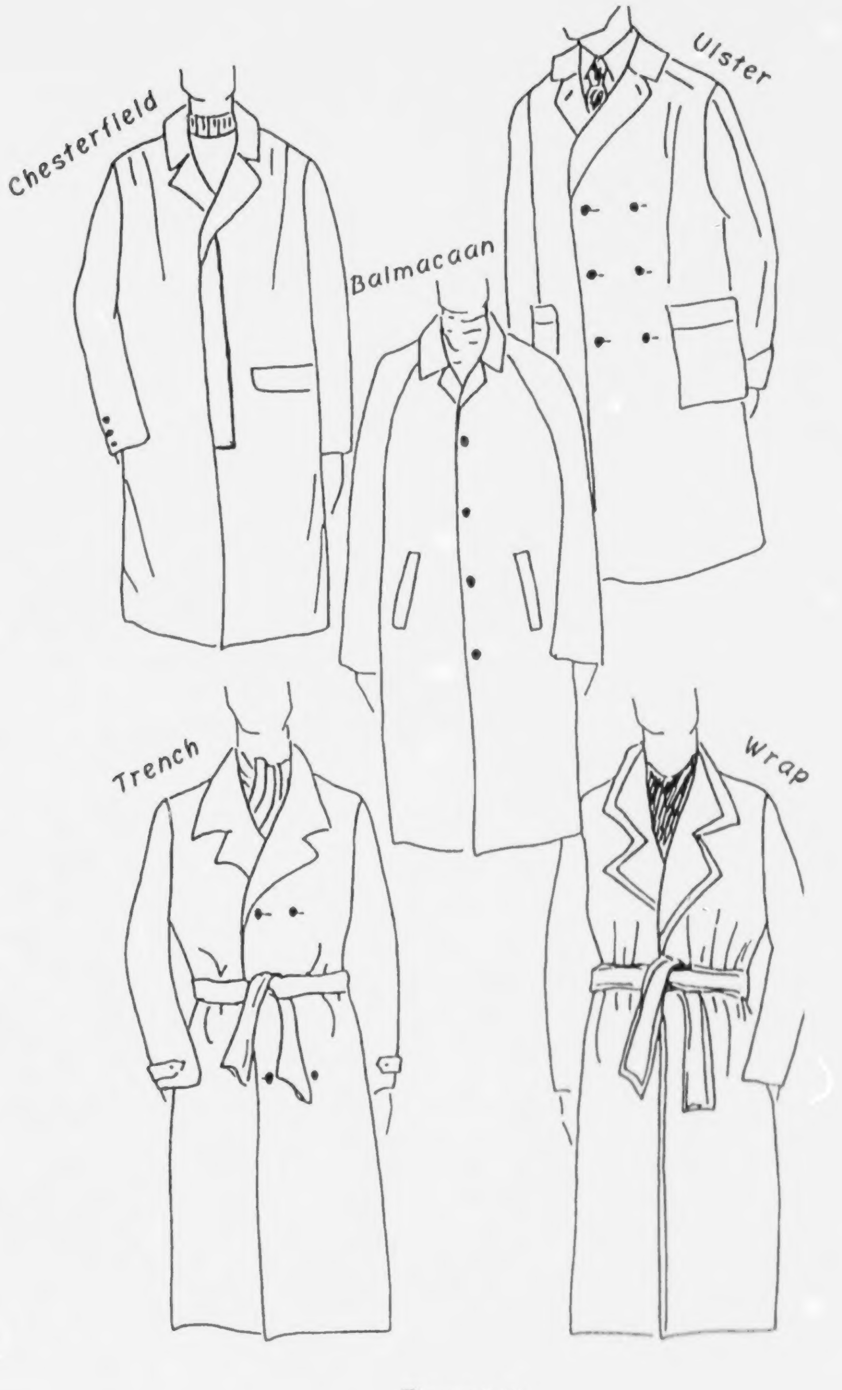


Figure 9.16

SELECTING AND COORDINATING APPAREL AND ACCESSORIES

The term ***coordinate*** refers to the combining of apparel and accessories to form a pleasing ensemble when worn together. In order to help customers choose apparel and accessories that complete an attractive outfit, employees should have an understanding of the various factors that affect the coordination of clothing. The elements and principles of design and the weight and hand of fabric all influence the selection and coordination of apparel and accessories.

The elements and principles of design are the guidelines that are followed when coordinating apparel and accessories. As discussed in Chapter Seven, the elements of design include line, shape or form, space, texture, and color. The principles of design include balance, proportion, rhythm, emphasis, and harmony or unity.

Factors to Consider When Selecting and Coordinating Apparel

Color. Color is usually the most obvious factor that is considered when coordinating apparel. Employees should be familiar with the color wheel and different color schemes to assist customers in coordinating attractive wardrobes. Basic color schemes include monochromatic, analogous, complementary, split complementary, double complementary, triad, and accented neutral.

When choosing color schemes, employees should understand the properties of colors and how they affect the appearance of apparel. Hue, value, tint, shade, and intensity all affect the appearance of color and must be considered when combining colors. More detailed information on color and color schemes is included in Chapter Seven.

An additional aspect to consider when assisting customers in coordinating colors is skin tone. Some individuals have skin with cool undertones while others have skin with warm undertones. Individuals whose skin has cool undertones look attractive in cool colors, such as blue, green, and purple. Individuals whose skin has warm undertones look attractive in warm colors, such as red, yellow, and orange. Individuals who have had their colors analyzed by a professional color consultant or image consultant will know if cool or warm colors look best on them, but they may need help in locating apparel of the correct colors.

Texture. Texture is the surface quality of an object. Texture plays an important role in the coordinating of appealing apparel combinations. Apparel items are available in a variety of textures, such as rough, smooth, shiny, soft, and harsh. The texture of an item often depends on the method used to construct the fabric. Variations in weaving and knitting can create ridges in fabric or make fabrics smooth, fuzzy, or shiny.

When textures are combined, they should be related or should contrast pleasantly. For example, the texture of shiny taffeta fabric does not complement the texture of rough tweed fabric, and the texture of lightweight cotton pants does not complement the texture of a tweed sports jacket. These textures are not related and do not form a pleasant contrast.

When textures are combined successfully, they express harmony and a pleasing appearance. Employees should practice combining textures and observe textures that coordinate well. Additional information on texture is located in Chapter Seven.

Weight and Hand. ***Weight*** is the heaviness or lightness and thinness or thickness of a fabric. ***Hand*** is the feel, body, and the way the fabric falls when draped. The weight and hand of fabric affect how well apparel coordinates. Additional information on weight and hand is included in Chapter Twelve.

Certain types of garments are generally made of certain weights of fabrics. Fabrics may be lightweight, medium-weight, heavyweight, or very heavyweight. Lightweight fabrics are usually used to construct shirts or blouses and are sometimes referred to as ***topweights***. Medium-weight fabrics are usually used to construct skirts and slacks, and heavyweight fabrics are usually used to construct winter suits and coats. Medium and heavyweight fabrics are sometimes referred to as ***bottomweights***.

When coordinating apparel, employees should consider the weight of different garments and attempt to match items of complementary weights rather than only items of similar weights. For example, a pair of medium-weight wool pants and a wool sweater make an attractive combination as do a lightweight silk blouse and a medium-weight wool skirt. However, a lightweight, casual cotton skirt and a heavyweight denim blouse do not complement each other.

Recommending Styles to Flatter and Compliment Various Body Types

Individuals have many unique body characteristics. Some people are tall and thin; some are tall and heavy. Some are short and thin; some are short and heavy. Some people are heavier at the hips, some heavier through the middle, and some heavier at the top portion of their bodies.

Clothing for both males and females should compliment and enhance their body figures. When helping customers select apparel, it is important to steer them toward styles that are flattering and complimentary.

In Chapter Seven, "Elements and Principles of Design," several guidelines are presented for selecting apparel to compliment each customer's figure. By applying these guidelines to the various garment styles and parts presented in Chapter Nine, an employee can help customers select styles most flattering to them.

For example, one guideline on page 100 states that a Y-line adds height and width to narrow shoulders and looks attractive on full figures. This Y-line might be achieved for a woman through selection of an A-line or sheath dress with a V-neckline.

On the contrary, one guideline states that horizontal lines make any figure appear shorter and heavier. A two-piece or two-colored outfit would create the impression of horizontal lines and would not flatter the short, heavy figure. For the same reason, a man with a short and heavy body type should avoid double-breasted jackets and pants with cuffs.

Another guideline on page 100 states that a T-line, a vertical line cut by a horizontal line, is a good choice for a tall person. Therefore, a square or off-the-shoulder neckline would be more flattering for a tall than for a short person.

Factors to Consider When Selecting and Coordinating Accessories

When accessories are being chosen to complement apparel, they should be analyzed according to various factors such as the intended use of the accessory, the design of the garment and the accessory, and the materials used to construct the accessory. It is important to take these factors into consideration since poor accessory choices can ruin the appearance of an otherwise well-coordinated ensemble.

The intended use of an accessory should be considered to ensure that the accessory complements the intended use of the garment. For example, when some shoes are designed, they are intended to be worn for formal or dressy occasions. Black patent leather shoes with a black bow on the toe are intended to be worn with dressy clothes or on special occasions. These shoes would not complement casual clothing such as jeans. Casual footwear such as athletic shoes is more appropriate to wear with jeans.

A western belt is another example of an accessory with an intended use. A western belt with a large belt buckle is intended to be worn with casual clothes such as jeans. Western belts with large, decorative buckles do not usually complement more formal attire such as a man's suit.

The design of the garment(s) worn also influences the choice of accessories. Accessories should enhance the design of a garment rather than detract from it. For example, a piece of jewelry such as a heavy gold chain might be worn with a scoop neckline while a lightweight drop necklace or a pendant necklace that forms the shape of a v might accentuate a v-neckline.

The type of material from which an accessory is made should also be considered when selecting and coordinating apparel and accessories. Some materials are considered more casual than others and are usually worn with casual clothing. For example, a necklace made of plastic is considered to be more casual than a diamond necklace. A plastic bead necklace is usually worn with casual garments while an elaborate diamond necklace is worn with dressy clothing or evening wear. In addition, a casual knit necktie coordinates better with a tweed sports jacket than a business suit. A necktie made of silk is usually worn to complement a business suit.

◆ Essential Questions: ◆ Selecting and Coordinating Apparel and Accessories

1. Why is it important for employees to understand factors that affect the selection and coordination of clothing?
2. What factors should be considered when choosing color schemes?
3. How do texture, weight, and hand affect the coordination of apparel?
4. What are examples of guidelines that apply elements and principles of design to selection of flattering apparel styles for the tall and thin body type? the short and heavy body type?
5. What factors should be considered when choosing accessories to complement apparel? Why?

Chapter Highlights

- When selecting apparel for infants and toddlers, employees should assist customers in making selections that are durable, well-proportioned, and comfortable for children.
- Basic apparel worn by infants includes diapers, shirts, and sleepers. Apparel for toddlers may include training pants, pants with elasticized waists, and pullover shirts.
- The style of a woman's blouse is usually characterized by the style of the sleeves, the style of the collar, and the shape of the neckline.
- Women's skirts are available in a variety of styles including A-line, circular, dirndl, flared, gathered, gored, pleated, straight or fitted, and wrap.
- Basic styles of women's dresses include the A-line, blouson, coat, empire, lowered waistline, princess, sheath, shift or chemise, shirtwaist, and tent.
- Women's coats (such as the balmacaan, capecoat, chesterfield, pea, princess, trench, and wrap) are worn over clothing to provide warmth and protection. Jackets (such as the bolero, box, Chanel, Norfolk, safari, and Windbreaker) are often worn to complement apparel.
- Types of men's jackets include single-breasted jackets, double-breasted jackets, sports jackets, and blazers. Men's pants include trousers and slacks.
- The style of a man's dress shirt is often characterized by the style of the shirt front, the collar, and the cuffs.
- Types of men's coats include the topcoat, overcoat, all-weather coat, and three-quarter length coat. These coats are often available in basic styles such as the balmacaan, chesterfield, trench, ulster, and wrap.
- Factors to consider when selecting and coordinating apparel include color schemes, textures of garments, and the weight and hand of fabrics.
- The intended use of accessories, the design of both garments and accessories, and the materials used to construct accessories should all be considered when coordinating accessories with apparel.
- Clothing for both males and females should compliment and enhance their body figures. The employee who can apply elements and principles to various garment styles and parts can help customers select styles most flattering to them.

Chapter 10

Textile & Apparel Marketing:

Promotion, Public Relations, and Special Fashion Events

Chapter Focus

The following Essential Knowledge and Skills are discussed in this chapter:

9A Describe various types of business promotion strategies.

9B Classify types of customers and their motives for buying textile and apparel products.

9C Describe roles of public relations and publicity in product promotion.

9D Explain the use of promotional activities to market textile and apparel products and services.

Chapter Vocabulary

- advertising
- baby boom
- charity show
- cooperative advertising
- customer show
- demographics
- display
- disposable income
- fashion business
- fashion promotion
- fashion show
- industrial or trade show
- inflation
- institutional advertising
- in-store show
- leisure time
- manufacturers
- marketing
- market segments
- mats
- merchandising
- nonpersonal promotion
- personal income
- personal promotion
- point-of-sale selling
- press release
- producers
- product advertising
- psychographics
- public relations
- publicity
- recession
- retailers
- retail show
- selling points
- showing
- special event
- target market
- trunk showings
- visual merchandising

Fashion can be defined in several different ways. *Webster's New World Dictionary* defines fashion as "the current style or mode of dress, speech, or conduct." Other references describe fashion as the style(s) of clothing and accessories prevailing at a certain time. As described in Chapter Two, most fashion sources agree that a fashion is a style that is accepted and used by the majority of a group at any one time. A variety of products have fashion appeal in addition to apparel. For example, sheets, furniture, draperies, and other textile-related items are designed using current styles that are popular in the marketplace. Therefore, the marketing of fashionable products includes apparel, accessories, home furnishings, and a variety of other fashion-oriented goods.

An increased focus on fashion in society has resulted in thousands of people being employed in fashion-related jobs. As discussed in Chapter Two, fashion industries are those industries involved in the production and distribution of the materials used in the production of apparel and accessories for men, women, and children. ***Fashion business*** is a broader term describing any business concerned with goods or services in which fashion is a factor. Included are manufacturing, distribution, advertising, publishing, and consulting.

Marketing is a system of business activities designed to plan, price, promote, and distribute products and services to customers. ***Merchandising*** refers to the planning required to present the right merchandise at the right time, in the right place, in the right quantities, at the right prices, and with the corresponding realized profit. Marketing and merchandising are considered to be sciences by many experts because they involve known facts and basic principles. Because of these facts and principles, actions and reactions of consumers can often be predicted.

There are a variety of jobs available in the area of fashion marketing and merchandising. Chapter Eleven addresses the area of visual merchandising. Some of the jobs available in fashion marketing are referred to as fashion communications jobs. Examples of fashion marketing and fashion communications jobs include fashion journalist, fashion writer, fashion illustrator, fashion trend researcher, and fashion advertiser. A fashion journalist reports fashion news by writing newspaper and magazine articles. A fashion writer develops educational or training materials on fashion, apparel, and textiles. A fashion illustrator draws illustrations of apparel•on fashion models for use in advertising, promotion, publicity, and journalism. A fashion trend researcher collects information about current and future trends in the fashion industry and predicts how consumers will react to fashion trends. A fashion advertiser is employed by a retailer, manufacturer, newspaper, or advertising agency to develop ideas for promotion of fashion goods.

There are numerous entry-level jobs available in the area of fashion marketing and communications. Some entry-level employees serve as assistants to professional level employees. As in other employment areas, entry-level employees may be promoted when experience and skills are gained.

MARKETING CONSIDERATIONS

Since marketing involves planning, pricing, promoting, and distributing products and services to customers, effective marketing requires an understanding of customers. Customers are motivated to buy in different ways. Customers are also influenced by environmental factors that impact fashion interest and demand.

Types of Customers

Each customer is unique. However, shoppers can be categorized into groups in order to analyze their motives and behavior while shopping. The innovative customer is one who buys a new item in order to be the first to use it. This customer enjoys being a trend setter, especially when purchasing clothing. A salesperson may be able to motivate sales by showing the innovative customer new merchandise available while providing trend-setting information.

A comparison shopper is a customer who visits a store to gain information about merchandise. The customer may check prices, quality of merchandise, product availability, brand names, purchase options, and other buying information. This person does not often make purchases on the first visit to a store. A comparison shopper's business can be encouraged by good selling techniques, by offering accurate information, and by providing quality goods and service.

An impulse buyer is a customer who makes a buying decision rapidly without much thought. Most often, buyers purchase relatively inexpensive items on impulse. Placement of impulse items in a convenient location for customer appeal is often done to encourage impulse buying.

A follower is a customer who generally chooses only products with well-known reputations. Followers tend to require complete product satisfaction prior to purchase. They may be influenced to purchase an item when they learn that a respected person or close friend has bought the same product.

Market Segmentation

To market products and services, fashion businesses try to identify and select target markets. A ***target market*** is a particular group of individuals who have similar characteristics that make them potential customers for a particular good or service. In the marketing process, businesses attempt to determine who their customer is, what the customer's interests are, how much the customer will pay for goods or services, where the customer is located, and how many customers there are in the target market. By separating the total consumer market into smaller groups, market segmentation is accomplished. The smaller groups are called ***market segments***. Market segments are studied by producers and retailers according to different characteristics of consumers in each segment. Demographic and psychographic information helps marketers analyze market segments and identify target markets.

Demographics refers to statistical data about a population. Demographic studies help to place customers and consumers into target groups. Examples of demographic characteristics studied by marketers include population distribution such as urban, suburban, and rural populations; age; gender; family life cycle stage; religion; ethnic background; educational level; occupation; and income. Demographically, the middle-income group in American society is typically the most important market for fashion merchandise.

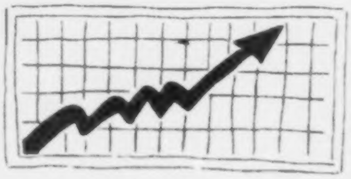
Psychographics are studies that help marketers identify more personal traits of customers. Factors are considered such as personality, attitude, interests, and personal opinions; and actual product benefits desired by customers. Psychographic studies help businesses understand the behavior of customers. Thus, marketers are able to match the image of the company and its product or service with the type of consumer using the product or service.

Economic Factors

Textile and apparel demand and consumption occur in societies with high levels of economic development. One indicator of U.S. economy is personal income. ***Personal income*** is the total current income received by everyone in the United States in a given year. ***Disposable income*** is the amount left from take-home pay after payments such as taxes have been deducted. A high level of disposable income means that consumers have more money to spend on goods and services.

Even though personal income may increase in a society, other economic factors can affect the purchasing power of consumers. For example, inflation can decrease purchasing power. ***Inflation*** is a general increase in the level of prices in the nation. When the general price level of goods and services rises, individuals and families are not able to buy as many goods and services as before even though they have the same income level. A ***recession*** is a low point in a business cycle. During a recession, interest rates are high, production decreases, and the unemployment rate increases. Both inflation and recession have profound effects on fashion marketing since extreme economic situations affect consumer spending.

Population



Population figures for a society are indicators that relate to fashion demand. The United States has a history of significant population growth. During the last eighty years, population has grown from 106 million people in 1920 to approximately 273 million in 2000. With increasing U.S. population, textile and apparel demand also increases.

The age mix of a population also affects fashion demand. Between 2000 and 2025, the largest growth is projected to occur in the U.S. population over age sixty-five. The aging of the U.S. population has been significantly impacted by the ***baby-boom*** group – the 77 million persons born between 1946 and 1964. The number of people over age sixty-five has grown also as a result of the longer life span of both men and women. With early retirement and increased retirement incomes, this group has significant influence on fashion demand. Since each population group has its own special fashion interests, needs, and reactions, changes in the age mix serve as important clues for marketers in predicting fashion needs and demands.

Sociological Factors

Fashion is viewed by some as a symbol of changes occurring in society. Consumers are influenced by changes in society. As consumer attitudes change, fashion changes. The increased leisure time of the average citizen is a societal change that has influenced fashion. ***Leisure time*** is time that can be spent away from work. People choose to spend their leisure time in various activities including sports, travel, entertainment, and self-improvement. Increased leisure time has caused consumers to demand clothing for casual living. More people require active sportswear for activities such as biking, skiing, tennis, golfing, and aerobics. The increased interest in maintaining good health requires special clothing for exercise and active lifestyles.

The status of women has changed drastically in our society since the early 1900s. As a result, more women are employed than ever before. Employed women are constantly exposed to fashion trends. They have an incentive to dress appropriately for their employment settings. In some cases, employed women have more discretionary income that may be used to purchase fashion items. When women reach higher educational levels, they are often more willing to accept new fashions. Such acceptance accelerates fashion change. In general women have more social freedom today than before. This freedom has changed lifestyles of women and influenced their preferences for fashion.

Various ethnic groups in the United States have influenced fashion profoundly. Between 1990 and 1999, about 23 million people were added to the U.S. population. According to the Population Reference Bureau, Hispanics were the fastest growing ethnic group, adding almost 8 million persons to the population in that period. African Americans, who added 3.7 million between 1990 and 1999, are currently the largest minority group in the United States. The Asian and American Indian U.S. populations also grew, although less significantly. Each of these ethnic groups has made a significant impact on society by introducing color preferences, musical and dance styles, and textile designs that have in turn influenced the textile and apparel industries.

◆ Essential Questions: ◆ Marketing Considerations

1. What is the difference between marketing and merchandising?
2. How is market segmentation used to target markets?
3. How can various economic factors influence marketing of textile and apparel products?
4. How do population trends influence marketing of textile and apparel products?
5. What are examples of sociological factors that influence marketing of textile and apparel products?

FASHION PROMOTION

The success of the overall merchandising process culminates in the promotion and selling of merchandise. The terms ***fashion promotion***, ***sales promotion***, and ***promotion*** may be used interchangeably. These terms refer to all activities used to bring customers into a store and influence their decisions to make purchases. Promotion includes both personal and nonpersonal activities. ***Nonpersonal promotion*** includes advertising, window and interior display (visual merchandising), publicity, special events, fashion shows, and public relations. ***Personal promotion***, or ***personal selling***, is the oral presentation used in conversation with a shopper for the purpose of making a sale. All retail stores use promotional activities to inform customers and to persuade them to buy.

As described in Chapter Six, products experience life cycles. They are introduced, are accepted, become popular, and eventually lose their sales appeal. Marketers must consider the stage of the life cycle for each product being promoted. A new product requires various promotional activities, such as informing potential customers about the product, its uses, and benefits. A new product may be advertised, promoted through personal selling, and featured at trade shows or exhibits. Often, companies test promotions before using them in different locations. As customers accept a product, a company's promotional activities are adjusted. Promotional activities may be planned to persuade customers to continue buying the product, such as offering rebates or special gifts to those who buy the product. When a product reaches the end of its life cycle, a business is likely to reduce its promotional activities.

Fashion promotion is conducted at various levels of the fashion industry. ***Producers*** are businesses that manufacture raw materials. ***Manufacturers*** are wholesalers of finished products. ***Retailers*** sell finished products to customers. All firms in the fashion industry participate in promotional activities. At every level of an industry, someone sells products and ideas to someone else. Figure 10.1 illustrates the multi-step process of marketing products from raw materials to the consumer.

At the retail level, the store management makes sales promotion policies and identifies the goals of sales promotion. The management approves the image to be presented, sets the sales promotion budget, decides what media to use, and plans the calendar of events for promotional activities. A store's sales promotions may be coordinated by a person or by a department. In smaller stores, one person may coordinate all sales promotion activities. In larger stores, a sales promotion division may be responsible for promotion through advertising, display, and publicity. Some stores have a separate public relations office that works closely with the sales promotion division.

In a shopping center or mall, merchants may combine their efforts for some promotional activities. Examples include sponsoring a Santa Claus, an arts and crafts exhibit, a petting zoo, or a sidewalk sale. When such events are advertised, the name of the shopping center or mall is used to attract customers to all of the stores in the retail area.

Advertising

Advertising is a nonpersonal promotion method used to influence sales by sending messages through media to an audience of

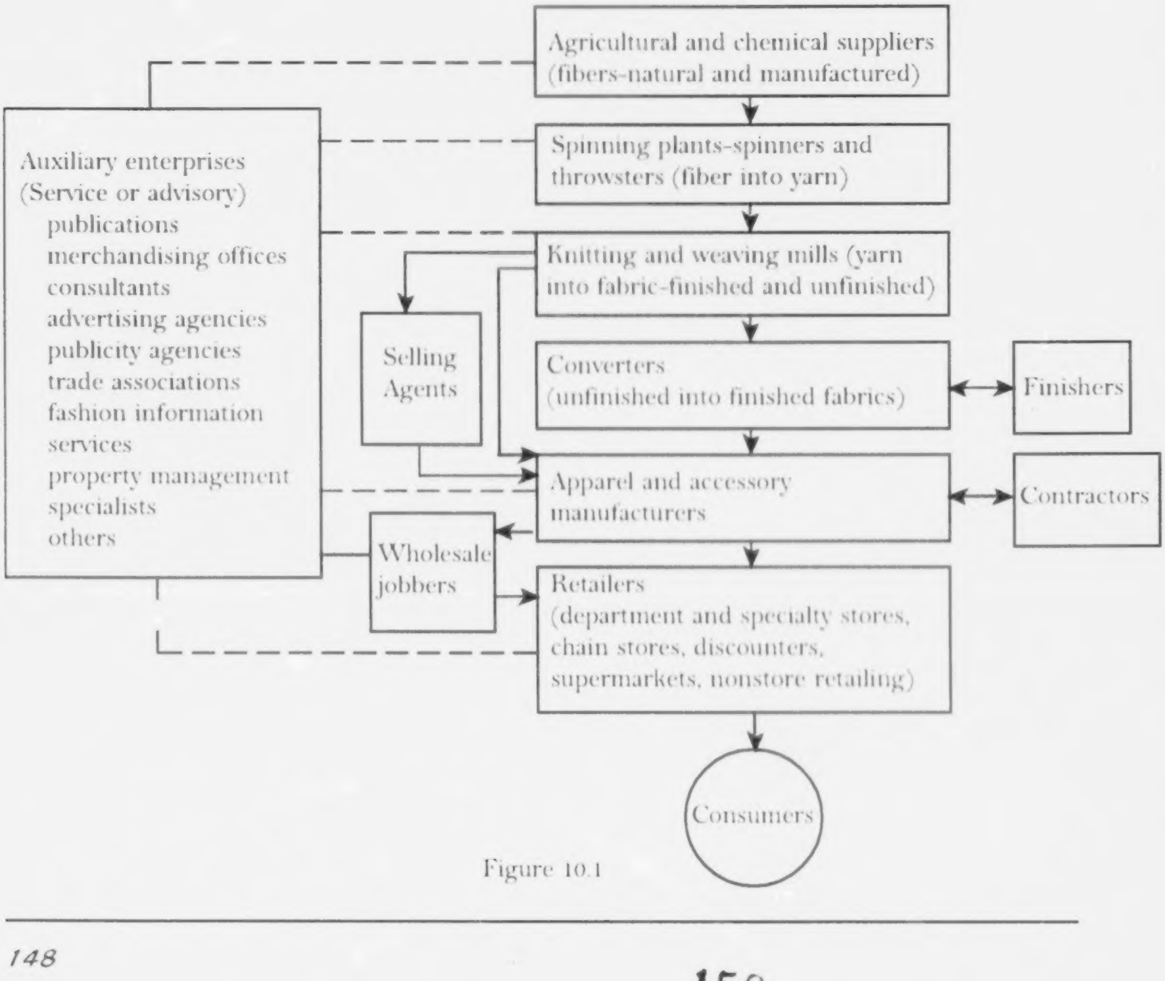

Agricultural and chemical suppliers (fibers-natural and manufactured)
Spinning plants-spinners and throwsters (fiber into yarn)
Auxiliary enterprises (Service or advisory)
publications
merchandising offices
consultants
advertising agencies
publicity agencies
trade associations
fashion information services
property management specialists
others
Knitting and weaving mills (yarn into fabric-finished and unfinished)
Selling Agents
Converters (unfinished into finished fabrics)
Finishers
Apparel and accessory manufacturers
Contractors
Wholesale jobbers
Retailers (department and specialty stores, chain stores, discounters, supermarkets, nonstore retailing)
Consumers

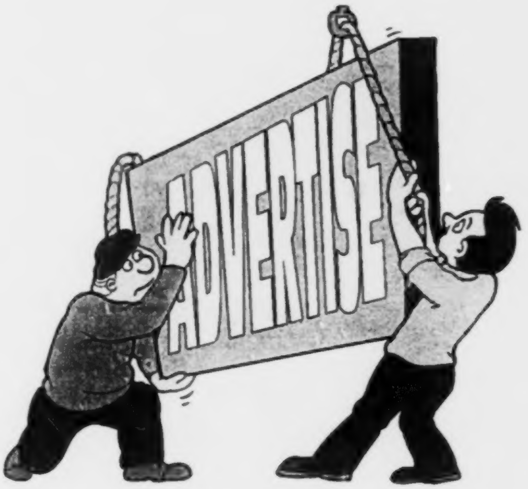
Figure 10.1

potential customers. The purpose of advertising is to inform the public about goods and services available and to influence the selling of goods, services, and companies. Large businesses often use planning committees to develop advertising plans. These committees may include representatives from various areas such as marketing, sales, merchandising, and sales promotion. Advertising plans should be made for at least six months at a time. Fashion advertising is often planned on a seasonal basis. Checking past sales records helps to identify when and how often to advertise. A record of advertisements should be kept so that past experience can guide future decisions. A scrapbook of past ads with notes about costs and results aids in making good advertising plans.

Small stores may use one person, often the owner or manager, to coordinate advertising. Sometimes, advertising agencies are hired by retailers. Advertising agencies create, prepare, and place ads for a fee.

Many aids for constructing ads are available free or at little cost. Manufacturers may provide photographs or sketches of their garments or suggested copy layouts called ***mats*** to assist in the preparation of retail ads. Retailers often obtain such aids during trips to market. The collaboration of manufacturers with retailers for promotional benefit is called ***cooperative advertising***.

Advertising may be classified by the sales objectives it is used to reach. The two broad categories of advertising are product advertising and institutional advertising. The main objective of ***product advertising*** is immediately to sell merchandise. Product ads include an identification, a description, and the price of products. Based on the ad, customers can make a decision to purchase the featured item(s) or decide to visit the store where personal selling is used to complete a sale. ***Institutional advertising*** is used to build a positive reputation for a company. Its main objective is to retain customers over a long period of time. Institutional ads are used to promote departments, services, facilities, features, merchandise, and personnel of a business. These ads are used to convince customers of a company's benefits and positive qualities.



Successful advertisements include the following common characteristics:
- The main idea is clearly presented.
- The sales objective is obvious.
- The ad builds on other ads used by the company in order to provide continuity.
- A consistent style is used in all ads by the company.
- The visual part of the ad or commercial is related to the verbal part.
- The ad is simple, concise, and direct.

These characteristics may be used to evaluate effectiveness of advertising presented through the newspaper, telephone directories, radio, television, direct mail, electronic media, billboards, or other methods.

Each type of advertising has advantages and disadvantages. Newspaper advertisements reach the largest audience for the least amount of money and can be changed quickly. Radio spots are inexpensive to produce and can be changed frequently, but do not permit visual presentation of merchandise. Direct mail can be effective if the mailing lists are chosen carefully. Television commercials require the services of specialists, are expensive to produce, and are difficult to change. Because many people depend on television for entertainment and communication, many retailers feel that the expense and time involved in television advertising are worthwhile.

Visual Merchandising

Visual merchandising, also known as ***display***, is a nonpersonal physical presentation of merchandise or ideas at the point of sale. This promotion method includes window, exterior, interior, and remote display. Many retailers believe that display serves as a bridge between mass communications and personal selling in the store. The details of visual merchandising are included in Chapter Eleven.

Personal Selling

The customer's primary contact with a retail store is the sales personnel. From the customer's viewpoint, the salesperson represents the retail organization. Therefore, the salesperson's role is vital to the success of the retailer. Because of this fact, good retail organizations provide continual training programs for their employees to ensure that employees understand personal selling techniques. Effective retail executives at the management level are aware of the importance of knowing the reaction of customers to various marketing techniques and to the merchandise and services provided by their store(s). A salesperson must do the following in order to be successful at personal selling:

- Be familiar with products and services sold in the store and understand their important qualities from the customer's perspective.
- Understand that many customers are too sophisticated to be talked into buying merchandise they do not want.
- Understand the importance of believing that the customer is always right in terms of providing customer service and resolving complaints.
- Know what merchandise is in stock so items can be located quickly.
- Understand what customers expect from salespeople in terms of service, information, and advice.

Two basic types of selling are self-service and personal or personalized selling. Personal selling involves an oral presentation with a prospective customer for the purpose of selling merchandise, services, or ideas. It involves a salesperson who personally approaches a customer and completes a sale. Selling that is conducted in a retail store on the selling floor is also called ***point-of-sale selling***. Self-service reduces the number of salespeople or eliminates all salespeople from the selling process. The advantages of self-service are a reduction in the retailer's selling cost due to a decrease in sales employees' salaries, increased efficiency when selling some types of merchandise, and increased satisfaction for those customers who prefer self-service. For those customers looking for personal attention, personalized selling can be advantageous. It also allows a salesperson to suggest additional information, increasing overall sales.

An effective salesperson knows that the objective of personal selling is to help customers buy what they want and need. It is important for a salesperson to seize opportunities to suggest advantages of goods or services, often called ***selling points***. An ethical salesperson will not persuade customers to buy items they do not want. The most important aspects of the personal selling process are the following:

- Get the customer's attention.
- Create an interest and desire for the product or service.
- Stimulate the customer to action (buying).
- Maintain customer satisfaction to avoid returns and ensure future business.

There are a variety of ways in which a skilled salesperson relates to customers and is effective in selling. Merchandise should be presented immediately and should be handled carefully to show appreciation for the quality of the goods. It is always best to show merchandise in use when possible. Customers should be encouraged to touch and handle merchandise. It is best to avoid showing too much merchandise at one time as this sometimes confuses customers. If a salesperson shows moderately priced merchandise first, it is easy to observe a customer's reactions and immediately know whether to show more expensive merchandise or less expensive merchandise.

In selling, the salesperson should tell the customer what he or she wants to hear about the particular merchandise under consideration. Stating what the merchandise will do for the customer gives the customer reasons to buy. Positive aspects of the merchandise should be emphasized. If a customer raises objections to merchandise, the salesperson should not argue with the customer. If necessary, it is best to accept the customer's objections and point out another feature of the merchandise that is positive.

Closing the sale is an important part of the selling process. Several techniques can help close a sale. The salesperson should usually refrain from showing merchandise other than the item(s) being considered by the customer. It is best to narrow the selection of merchandise to the items in which the customer seems most interested. Sometimes, the salesperson may want to suggest stimulators, questions that stimulate a response or decision from the customer. For example, a salesperson may say "Which of these do you like best?" or "Would you like to charge this?" Salespeople may be able to make additional sales by suggesting merchandise to the customer that is related to the item(s) being purchased. For example, if a customer buys pants or slacks, the salesperson may suggest a blouse or shirt that coordinates well with the selected item. In addition, salespeople should also alert customers regarding sales, specials, and advertised merchandise that is presently available.

◆ Essential Questions: ◆ Fashion Promotion

1. What are the three levels of the fashion industry at which fashion promotion is conducted?
2. How is advertising used to inform the public?
3. What are two broad categories of advertising?
4. What are the most important aspects of personal selling?

PUBLIC RELATIONS

Public relations is a broad term that covers a company's overall program of creating goodwill. The area of public relations includes all activities used to develop goodwill with the public, the community, the government, and customers. An important part of public relations may be to educate the public regarding a particular point of view or the use of a product. To be effective, public relations must be well planned and must be implemented by all employees in a company.

A good public relations program presents a positive image of a store to the community. Having an image as a financially sound, progressive organization is an advantage to a business. Public relations also helps emphasize that a business' actions and statements are dependable, honest, and truthful. When developing a public relations plan, the management of an organization must consider what type of image they wish to project. Management may choose to offer services such as delivery, installation, and gift wrapping to help in the development of a positive image. Salespersons may be asked to become familiar with needs and desires of specific customers and give personal calls when desired merchandise comes into the store.

Publicity

Publicity is an important part of the public relations process that cannot be directly controlled by the retailer. ***Publicity*** provides verbal or written information through a news or feature story about a product, place, thing, person, or idea. Publicity can result from an event that is deliberately created or from alert coverage of an event occurring that is of interest to a firm's target market. Some may consider publicity a free form of advertisement since companies do not pay for media coverage of events. However, publicity is actually never free. Companies must invest money into programs that will motivate influential columnists, commentators, publications, and personalities to report on them positively.

The most commonly used method for communicating publicity material to the media is through use of publicity releases or press releases. A ***press release*** is used to describe upcoming events, new products, and other news that is of public interest. Press releases are used by different media in different ways. One newspaper might use a release as a minor news item, and another newspaper might use it as a feature story.

To gain publicity, it is important to understand the news business and how editors and producers evaluate material for their publications and broadcasts. Knowing to whom publicity material should be sent and maintaining continued, friendly contact with these individuals is very important. It is vital to understand the content and layout of newspapers and magazines that reach a target market. Publicity people should also become familiar with the programming and broadcast schedules of radio and television stations that reach their target market. Everything appearing in a newspaper or on a television news program is not news. Newspapers, magazines, radio stations, and television stations attempt to give their audiences good reasons to read, watch, or listen. The publicity person must provide publicity information that will fit the specific goals and needs of each publicity medium.

Two primary factors influence a newspaper editor's decision about using a story submitted for publicity. One factor is the amount of space available in the newspaper for the publicity material. Newspapers must devote a certain amount of space to paid advertising in order to make a profit. The second factor is the other material that is presently competing for the available space. Each press release will be evaluated in terms of its importance to the readership. If there is competition for space, press releases of little interest to potential readers will probably not be used. Thus, it is very important to prepare a press release for the potential audience and send it to the right newspaper editor. Most newspapers are organized into departments. Key people to know include the city editor, the business manager, and various department editors who serve specialized interests such as gardening, art, music, society information, education, and fashion.

Television programming consists mainly of network programs and movies. Therefore, there is little chance to receive publicity from television except for major events or through local programs. Radio offers good opportunities for coverage of local events. Broadcast media are required to use a certain portion of their air time free of charge for coverage of public service activities. The publicity person for a firm should target news programs, panel and interview programs, and special interest programs produced locally as potential sources for publicity.

News coverage results when people are involved in various types of activities. Getting the store owner or a key manager to speak to business groups may gain publicity. Presenting a special award from a store can also result in publicity. Sponsoring a contest in the community or key employees becoming active in local organizations are other methods of gaining valuable publicity. It is crucial that a message presented through publicity be consistent with the experiences customers have when they visit a store. Otherwise, all of the publicity efforts are of no value.

Special Events

Special events that involve customers often result in publicity. A ***special event*** is a device, feature, service, sales inducement, exhibit, demonstration, or attraction that is used to influence someone to buy merchandise. The store's publicity department distributes press releases about special events to gain as much publicity as possible. Some special events are designed especially for publicity but may also be successful at selling merchandise. Certain events may be so popular that they become traditional events.

Sometimes special events are planned simply to draw the public to a store, mall, or shopping center. The presentation of a well-known celebrity from a children's television show may draw families into a retail area. Seasonal parties for children, such as a Halloween event, may be used to gain publicity, establish goodwill, and bring crowds to a store to gain exposure to merchandise. Figure 10.2 depicts typical seasonal promotional periods geared to consumer buying patterns.

Merchandise Events. Special merchandise events may be offered to the public. Such events are often developed around themes such as patriotic, cultural, seasonal, holiday, and traditional themes. An example of a traditional theme is the annual white sale of linens conducted in many retail stores during January. A number of stores through the country have used ethnic themes to promote imported fashion merchandise. Imported items from countries in the Far East, South America, and Europe are often promoted by taking advantage of the unique qualities of the ethnic merchandise.

- January is a clearance month. Stores offer merchandise at promotional price levels. The buyer is anxious to dispose of old goods and bring inventory down to a low level because January 31st is the end of the fiscal period.
- The heaviest spring customer buying period is in the weeks immediately preceding Easter.
- Post Easter is usually the spring-clearance period.
- Post Easter is the start of the summer buying period.
- July is the price promotional period of summer goods. (Many stores promote off-price fashion in late June.)
- Immediately following July 4th, the fall season begins for many stores, especially in the south where the summer period is long.
- August and September are the strong customer buying periods for fall merchandise. August store stocks offer wide assortments to determine the "winners."
- October is a clearance month for many stores. It is the month of lowest volume of the last quarter.
- December is the period for Christmas shopping and represents the best month of the year for departments offering merchandise suitable for gifts. Ready-to-wear selling is generally not accelerated during this period. However, sportswear enjoys the best month of the year.
- Repeated holiday selling patterns are exemplified by Mother's and Father's Days, for which gift-type merchandise must be prepared at levels of expected demands. Preparation for each of the periods is dependent upon the type of merchandise with increased or decreased seasonal demand.

Figure 10.2

Demonstrations and Educational Events. Some retail stores conduct demonstrations and educational events for promotion. Such events promote merchandise while developing good public relations. Cosmetic departments frequently use demonstrations to promote their products. Trial samples may be given to customers to help them in deciding on purchases. A demonstration on creative ways to use scarves as fashion accessories is another example of a promotional demonstration. Often, demonstrations are presented by individuals who are trained by manufacturers and are highly skilled at showing products and their uses. An educational event, such as a lecture by a well-known make-up artist on beauty trends, may be used to gain publicity and promote products. A workshop on decorating with sheets and towels might be used as a special event.

Fashion Shows. A ***fashion show*** is a special event that provides opportunities to present fashion merchandise in living and moving form. Fashion shows are usually presented for customer audiences. However, they may also serve to orient, train, and stimulate the personnel of large stores. The fashion show is a promotional event that is very important in the fashion industry.

A fashion show is a dramatic event that produces excitement and entertainment. Fashion shows can range from very formal productions with professional models, music, scenery, and professional staging to informal shows using customers and employees as models. The formal show has a theme that is identifiable. It is a staged production with a script and commentary. The formal show generally involves inviting an audience; the audience is usually seated and the show has the characteristics of a theater production. It is important to use a commentator who has good speaking skills and ability to improvise.

An informal fashion show is not as rehearsed as a formal show. In addition, the theme may not be as easy to identify. Sometimes a commentator is not used in an informal show. The audience members may read information describing the merchandise being shown from cards or programs. Sometimes an informal fashion show is called a ***showing***.

In addition to classifying fashion shows according to how formal they are, they may also be classified by the type of audience and the sponsor. Fashion shows are conducted at different stages in the marketing process. The ***industrial show***, or ***trade show***, is sponsored by a producer of raw materials, such as a producer of textiles or a manufacturer of apparel. The audience for the industrial or trade show usually consists of industry professionals and members of the press. For example, a trade show may be presented by a producer of textiles for apparel designers, retailers, buyers of fabric for apparel manufacturers, and members of the press. In turn, a fashion designer may present a fashion show for retailers and members of the press.

A ***retail show*** is sponsored by a retailer and may be presented to various types of audiences. There are different types of retail shows including the in-store show, the customer show, and the charity show. An ***in-store show*** is used to educate store employees regarding new fashion merchandise the store will promote. These shows provide information, stimulate enthusiasm, and suggest ways to sell the merchandise. The ***customer show*** is presented to customers and features themes such as seasonal merchandise, designer fashions, or private label apparel. Sometimes, a manufacturer will assist in presenting a customer show that features its merchandise. A manufacturer may send special sales representatives to present shows that are called ***trunk showings***. Trunk showings are informal, are presented on the selling floor, and may be presented prior to the selling season. A ***charity show*** is usually co-sponsored by a retailer and a local institution (such as a school or hospital) or fund-raising charity. These shows sell merchandise, promote goodwill, and build a positive image for the retailer.

The planning of a fashion show is important to the show's success. Employees may be assigned the responsibility of conducting various aspects of a fashion show, such as preparing clothing, assisting models, setting up the stage, and a variety of other jobs. The following factors should be thoroughly planned in preparation for a fashion show:

- theme
- fashion show coordinator
- audience
- overall plan
- merchandise
- models
- budget
- staging
- dressing space
- commentary
- program
- rehearsal
- promotion and publicity

◆ Essential Questions: Public Relations ◆

1. Why is a good public relations program important to an organization?
2. What three suggestions can you offer for obtaining desired media publicity?
3. What are three examples of special events stores might use to attract publicity? Describe each.
4. What different types of fashion shows might be presented?

Chapter Highlights

- ☆ Fashion is a style that is accepted and used by the majority of a group at any one time.
- ☆ Marketing is a system of business activities designed to plan, price, promote, and distribute products and services to customers. Merchandising refers to the planning required to present the right merchandise at the right time, in the right place, in the right quantities, at the right prices, and with the corresponding realized profit.
- ☆ A variety of jobs exist in the fashion marketing or fashion communications area including fashion journalist, fashion writer, fashion illustrator, fashion trend researcher, and fashion advertiser.
- ☆ Fashion businesses try to market products to particular groups of people who have similar characteristics that make them potential customers. Demographic and psychographic information helps marketers analyze market segments and identify target markets.

(Continued on page 156)

Chapter Highlights

(Continued from page 155)

- Economic factors such as total personal income and level of inflation impact marketing of textile and apparel products.
- Characteristics of the population in our society relate to fashion demand.
- Sociological factors such as leisure time, the status of women, and ethnic groups influence fashion.
- Fashion promotion, sales promotion, and promotion are terms that refer to all activities used to bring customers into a store and influence their decisions to make purchases.
- Products go through life cycles and marketers should consider the stage of the life cycle for each product being promoted.
- Fashion promotion occurs at different levels of the fashion industry including production, manufacturing, and retailing.
- Advertising is a nonpersonal promotion method used to influence sales by sending messages through media to an audience of potential customers.
- The two broad categories of advertising are product advertising and institutional advertising.
- Visual merchandising, also known as display, is a nonpersonal physical promotional presentation of merchandise or ideas at the point of sale.
- Personal selling is an oral presentation with a prospective customer for the purpose of selling merchandise, services, or ideas.
- Public relations covers a company's overall program of creating goodwill.
- Publicity provides verbal or written information through a news or feature story about a product, place, thing, person, or idea.
- A special event is a device, feature, service, sales inducement, exhibit, demonstration, or attraction that is used to influence someone to buy merchandise.
- Examples of special events are merchandise events, demonstrations and educational events, and fashion shows.

Chapter 11

Visual Merchandising

Chapter Focus

The following Essential Knowledge and Skills are discussed in this chapter:

10A Identify components used in developing displays.
10B Determine ways in which design elements and principles are used in the creation of displays.
10C Describe types and uses of interior and exterior displays.
10D Create window or other displays of textile and apparel products.

Chapter Vocabulary

center of interest
contrast
decorative props
descriptive signs
display assistant
display director
display specialist
dominance
fixtures
focal point
freelance display specialist
functional props
signage
structural props
trimmer
visual merchandising
visual merchandising director

Read chapter sections for additional terms related to window displays, interior displays, and basic display arrangements.

As previously noted, display is defined as a nonpersonal physical presentation of merchandise or ideas at the point of sale. ***Visual merchandising*** refers to various methods used to make a business attractive and efficient in selling merchandise. Visual merchandising includes store design and layout, lighting, signs, fixtures, and displays. Interesting displays of merchandise in windows and inside stores are created to persuade customers to identify with certain styles and fashion ideas. Good displays attract customers into stores and into departments within stores. Interior displays and point-of-purchase (POP) displays are even used in some stores as substitutes for personal selling.

DISPLAY EMPLOYMENT OPPORTUNITIES

The responsibility for creating displays is assigned to specific employees. In small businesses, the owner or manager may assign display work to employees who were not specifically hired or trained in visual merchandising. A display director may be hired in a large store. The ***display director***, or ***visual merchandising director***, is responsible for planning and creating all exterior and interior displays. The director supervises and coordinates the work of other display employees and coordinates display plans with advertising and publicity directors.

A ***display specialist*** is a person who is specifically trained or talented in one area of visual merchandising (such as lighting or animation). Display specialists are hired by some stores. A ***display assistant*** is an entry-level display employee. The display assistant assists the display specialist in construction, installation, and maintenance of displays. A display assistant may also perform general housekeeping duties in the display department. A ***trimmer*** usually has more display experience than an assistant. The trimmer may create designs or implement designs of the display director. This individual has some skill in arranging displays, selecting and using accessories, and fitting mannequins. A ***freelance display specialist*** provides display services to businesses for a fee. A business that does not have a display department may hire a freelance display specialist.

Although display employees often coordinate display development, other employees are involved in the process. Owners and managers of small stores may develop and build displays. Buyers and department managers of larger stores may suggest display ideas. In some stores, buyers coordinate at least part of their own departments' displays but ask for help from the display department. Salespeople and stock personnel may set up, straighten, and restock displays.

◆ ***Essential Questions: Display Employment Opportunities*** ◆

1. How do display and visual merchandising differ?
2. What are examples of jobs available for people who specialize in display?

WINDOW DISPLAYS

Window displays promote sales by showing customers available merchandise. Window displays serve their functions while a store is open and after the store closes. Two major categories of window displays are selling displays and prestige displays. ***Selling displays*** are designed to sell merchandise immediately. ***Prestige displays***, or ***institutional displays***, are designed to project a positive image for the store. The principles that make an advertisement effective are also used to create effective window displays. Many retailers consider window displays to be their most effective form of sales promotion.

Types of Window Displays

Series displays are those in which several adjoining windows are used to display a common merchandise theme. ***Related displays*** are those in which various classifications of related merchandise are arranged in one window. A related display tells a merchandise story and shows items that are used together or during the same season. For example, a man's suit might be displayed with coordinated shirt, tie, shoes, and jewelry.

Single-category displays are those that feature a single type of merchandise at one price. ***Campaign window displays*** are those in which the same type of merchandise is featured for several weeks in the same windows. A specific sales message is repeated for a period of time. ***Single-promotion displays*** are those using a major selling event in all or most of a store's windows. Sometimes, these displays are called ***special event displays*** and are used to celebrate events such as holidays, business and community recognition days, store anniversaries, and special promotions. ***Sale displays*** are used to show bargain or clearance sale merchandise. ***Line-of-goods displays*** are used to show items from one manufacturer. ***Mass displays*** usually include many varied, low-priced items.

Responsibilities Related to Window Displays

When retailers use the ***departmental method*** of assigning responsibility for window displays, certain windows are assigned to certain departments. The ***rotation method*** involves the rotation of window assignments from one department to another in order to display a wide assortment of merchandise. The management of each store decides on the merchandising policies for the store. It is important that window displays project the store's attitude and desired image toward fashion trends, featured brands and styles, and fashion themes.

Most stores change their window displays once each week. Each store develops a policy regarding how frequently displays are changed. A store located in a high traffic area may change window displays frequently. Stores in smaller communities may change their window displays more frequently than stores in larger cities. Stores in residential locations may be viewed more frequently than stores in business districts. In order to keep customers interested, displays should be changed at regular intervals. The advantages of frequent changes in window displays include the following:

- Current merchandise can be featured.
- A greater assortment of merchandise is featured.
- Merchandise does not become faded or soiled through long-term display.

Types of Windows

Three types of windows are commonly used in retail stores. An ***open window*** permits customers to see into the interior of the store. The ***closed window*** is a closed-in compartment which does not allow customers to view the inside of the store. The ***semi-closed window*** has a partial background that hides some of the store's interior. The open window is frequently used in shopping centers having large amounts of automobile traffic rather than pedestrian traffic. Open windows allow projection of selling areas to people passing by a store. Potential customers form an impression of the interior of the store. Open windows are less expensive to construct and maintain than closed windows. Open windows allow customers to see inside activity that may entice them to enter the store.

Some retailers feel that open windows have certain disadvantages. Open window displays may not be as dramatic as those presented in closed windows. Open windows allow the interior of the store to be viewed at all times. Some customers may not enjoy shopping in a store where they are on view. In addition, if the store is empty, a negative image may be projected, and customers may not wish to enter. It is difficult to emphasize a single item or theme in an open window display. Open windows also allow less space around exterior walls for storing stock.

Components Used in Window Displays

The following physical components are used when arranging window displays:

- merchandise
- functional props
- decorative props
- structural props
- background
- floor covering
- lighting

The designer of a window display must use creativity in combining all of the display components in a manner that is appealing and attractive.

Merchandise is the central focus of any display. It should be chosen carefully to meet the store's objectives and should be consistent with store policies. The merchandise selected should be attractive, of interest to customers, and timely. ***Functional props*** are used to physically support or hold merchandise. These props include mannequins, apparel or jewelry forms, screens, pedestals, tables, and stands. ***Decorative props*** include a wide variety of materials and items used to establish a mood or setting for the merchandise being displayed. ***Structural props*** are items such as boxes, stands, and cylinders that are used to support functional and decorative props.

A display background may be used to communicate a theme or may contrast with merchandise in the display. It is important that a background blend with the remainder of the display instead of detracting from the merchandise. Materials such as fiberboard, fabric, and wallboard are used for backgrounds. Background materials may be covered or painted.

The floor covering should blend well with the display background and should not detract from the merchandise being displayed. Often, neutral colors, such as gray, black, and beige, are used for floor coverings. Materials such as carpet, cork chips, rocks, grass mats, straw mats, and woven materials may be used for floor coverings.

Lighting directs the customer's attention to the display. Effective lighting may be used to highlight merchandise features such as texture, color, and size. ***Floodlighting*** is a lighting technique that directs light over the entire display area. Recessed ceiling lights are often used for floodlighting. ***Spotlighting*** is used to focus attention on particular spots or items. ***Pinpointing*** focuses a narrow beam of light on a specific item.

The colors of the window background and the merchandise affect the amount of light needed. Because light colors reflect light, less lighting is needed for light colors and backgrounds. Dark colors absorb light so that more light is required. Colored lights are sometimes used in displays to create contrasts and special effects.

Lighting fixtures should usually not be seen in displays. Lights may be attached to the ceiling or placed behind props or merchandise. Lights should never be placed near flammable objects. Window display units should be well ventilated to prevent heat buildup as a result of lights overheating.

◆ Essential Questions: ◆ Window Displays

1. What are the two major categories of window displays? How do these differ?
2. What are six types of window displays? Define each.
3. What are advantages and disadvantages of the three common types of windows?
4. What are the major components of window displays?

INTERIOR DISPLAYS

Displays inside a retail business are called ***interior displays***. Interior displays are used by most retailers in combination with window displays and advertising. The following three major objectives are involved in the planning of interior displays:

- presenting assortments of merchandise
- introducing ideas to customers
- suggesting related merchandise

Interior displays help customers locate merchandise they have seen in windows and ads. Interior displays can create an image and a personality for a store. New looks can be created as needed.

Interior displays should be located where customers will see them. There are certain locations in stores that most retailers use for display purposes. The following places are good locations for interior displays:

- near store entrances and exits
- at the ends of aisles
- near service counters
- at angles to store traffic
- at eye level
- at check-out counters and near cash registers
- next to related items
- near entrances to departments
- in front of open window displays

Types of Interior Displays

There are several types of showcase displays. ***Showcase displays*** include all of the following:

- sides of selling cases where merchandise can be viewed through the glass
- glassed-in wall cases behind a counter where stock is stored and merchandise can be seen
- open, recessed areas above and behind the selling counter called shadow boxes
- interior windows usually built into spaces beside doorways, elevator areas, escalators, and stairways

Counter displays are arrangements of merchandise on selling counters. A display on a selling counter must be limited to prevent interference with personal selling. In addition, large counter displays may hide other merchandise in glass counters. Counter displays are most useful in helping salespeople show customers various selling points to motivate them to purchase.

Platforms are often used to display fashion merchandise. Platforms are stages that elevate the display area. Display employees often add artistic and dramatic effects to platform displays. Platform displays allow expensive items to be displayed without the merchandise being easy to touch. Clothing on full-size mannequins is typically displayed on platforms.

Shadow boxes are small, enclosed display boxes that are open on one side only. They are sometimes built into interior walls or placed above counters. Usually one item is displayed in a shadow box. Such displays are especially appropriate for expensive items such as jewelry. In addition, fashion merchandise, such as shoes, gloves, men's ties, and handbags, can be appropriately displayed in shadow boxes.

Environment displays involve placing merchandise in a realistic, life-size setting. Furniture and appliances are often featured in environment displays. These lifelike displays help customers imagine the benefits and satisfactions they would obtain from ownership of the featured merchandise.

Miscellaneous displays include a variety of other interior display techniques used by stores. ***Island displays***, or ***gondolas***, are designed using large, open display tables that are stacked high with featured merchandise. An island display can be approached from all sides and may be created in floor space that is otherwise not being used. ***Free-standing display units*** are sometimes placed in areas where traffic allows them. One type of free-standing display unit is an aisle display. Aisle displays are placed at the end of aisles that come to a dead end. Other displays are placed in stores depending on the particular space and facilities available. Walls, columns, and ledge space are often used for display areas. ***Hanging displays*** are displays suspended from the ceiling or other support. The displays are usually suspended by strong, invisible wire. Fashion goods are often suspended to attract attention. Too many hanging displays tend to give a store a cluttered appearance.

Point-of-purchase displays (POP displays) are displays arranged in areas where customers make shopping decisions. Manufacturers of merchandise often provide POP displays to retailers. With increased technology, POP displays may include items that attract customers' attention, such as computerized devices. For example, a cosmetic company may provide a computerized display that allows customers to respond to questions regarding skin and hair color, skin tone, and other factors that affect choice of cosmetics. ***Self-selection displays*** are displays designed to help customers select merchandise without assistance. Video kiosks are video machines that display merchandise visually so customers can see merchandise in a moving format. For example, a video might be shown of a fashion show in a clothing department, or a video demonstrating different ways to tie scarves might be placed in an accessory department.

◆ *Essential Questions: Interior Displays* ◆

1. What three major objectives do planners of interior displays try to achieve?
2. What are examples of good locations for interior displays?
3. What are the major types of interior displays? How is each used?

USING ELEMENTS AND PRINCIPLES OF DESIGN

The elements and principles of design are discussed in Chapter Seven. These elements and principles are used extensively in designing effective displays.

Elements of Design

In display design, line is used to direct the attention of the person viewing the display. Line may be applied through arrangement of displayed items, the outlines of displayed items, or background materials selected. Line may also be used to create an impression or mood. For example, straight lines usually create an impression of stiffness or rigidity. Curved lines tend to create an image of freedom or movement. The direction of the line used in a display is also an important consideration. Vertical lines establish an impression of height. Diagonal lines tend to be used in dramatic presentations. Horizontal lines provide an impression of width.

Shape or form is used to describe display units and the form of items placed in displays. It is important to combine items in a display that have complementary shapes. It is also important to consider the shape of a display unit when considering which merchandise to display. In some cases, display units or areas have no particular shape. Such display units have a floor but no sides, background, or ceiling.

Color is used in displays to attract attention. Specific colors also create certain impressions. For example, blue creates an impression of calmness and quiet. Yellow projects warmth and happiness. Red is dramatic and indicates strength. Violet represents quality and richness. It is important to consider the use of color schemes when creating displays. Commonly used color schemes are described in Chapter Seven.

Space is related to the size and weight of objects. Space is sometimes defined as the background against which forms or shapes are seen. Size is usually discussed in terms of relationships between objects. When designing a display, the sizes of displayed items and the display space are compared to ensure that adequate space is allowed.

Texture refers to the look and feel of an item's surface. Usually, texture is identified by touching an object. However, because people are familiar with the textures of many materials, textures can also be recognized by simply looking at objects. Textures used in displays are often selected to set the stage for presentation of merchandise. In some cases, the textures of props may be selected to contrast with the merchandise displayed. For example, velvet is often used to display jewelry because the softness of velvet contrasts with the hardness of the jewelry. Display specialists may choose to work with the natural textures of objects, or they may apply artificial textures to objects. Sometimes, paints and inks may be used on props and background materials to simulate desired textures for a particular look.

Principles of Design

The principles of design are discussed in Chapter Seven in relation to fashion design. These principles are also applied when designing displays. All parts of a display should be planned so that an impression of oneness or completeness is created. This impression of all components going well together is called unity or harmony. In an effective display, the intended idea is clear and no parts of the display are overdone. Objects that are used together or associated with each other should appear together to create harmony. For example, autumn leaves might appear in a back-to-school display.

Rhythm is a pattern of movement. Rhythm may be created through the use of repetition. Repetition is used when several of the same item are displayed. Several exact duplications of items may be presented together, or different sized items may be alternated to create rhythm. Repetition is discussed further in the following section on basic display arrangements. Gradation may also be used to create harmony and rhythm. Gradation involves the variation of an element by degrees. For example, a background including a road that becomes smaller in the distance suggests depth and draws the viewer into the display. Contrast may also be used to create harmony and rhythm. Contrast involves showing opposite or complementary features in the items on display. For example, complementary colors may be used in a display and if applied appropriately, will create rhythm and harmony.

Emphasis is achieved when attention is drawn to a certain part of a display design. The principle of emphasis is also sometimes called ***dominance***. Dominance may also be created by displaying an item as a focal point of a display. A ***focal point***, or ***center of interest***, is a single item, such as a mannequin, that appears as the dominant feature of a display. A focal point may also be created through use of design elements. For example, a focal point may simply contrast in color or shape with surrounding objects.

Proportion refers to the relationship of parts to each other and to the design as a whole. Proportion also involves the relationships of objects to the space around them. If a display area and props are too large compared to the merchandise displayed, the display will not achieve its purpose. If the display area and props are too small for the merchandise, the merchandise may appear crowded. Display specialists usually find it easiest to begin arranging a display at the center of the display floor and arrange items or display parts backward and forward. Considering the vertical space in thirds helps the display specialist to apply the principle of proportion.

Balance involves being equal, usually in weight or quantity. Balance refers to arrangement of design parts to create a feeling of equilibrium. Formal balance, sometimes called symmetrical balance, involves the weight being concentrated in the center of a display. The design is the same on each side of the design center. Items do not have to be exactly identical on each side of the center to be considered symmetrical. However, the weight on both sides of the design center should be the same. Formal balance is usually not considered to be as interesting as informal balance. Informal balance, sometimes called asymmetrical balance, is a more casual design. The design is balanced but is different on each side of the design center.

◆ Essential Questions: ◆
Using Elements and Principles of Design

1. How might each of the elements of design be applied in designing displays?
2. How might each of the principles of design be applied in designing displays?

DISPLAY ARRANGEMENTS, SIGNAGE, AND FIXTURES

Several basic display arrangements are commonly used to create effective displays. Various types of fixtures and signs may be used within these arrangements to emphasize important points and to support and display merchandise.

Basic Display Arrangements

A ***single-unit arrangement*** is a presentation of only one unit with minor details. Usually the merchandise is supported by a single prop. A dress and basic accessories displayed on a mannequin is an example of a single-unit arrangement.

Repetition is a display arrangement involving repeated design. Repetition arrangements are created quickly by placing one kind of merchandise in rows stacked or hung on top of each other. Spacing and direction of the merchandise is repeated over and over. Placement of repetition arrangements in high-traffic areas increases their effectiveness.

A ***step arrangement*** involves a gradation of height. Such displays simulate a staircase. Merchandise may be displayed on pedestals or boxes of varying heights and arranged in increasing heights. Shoes are often displayed in step arrangements.

A ***zigzag arrangement*** is a variation of the step arrangement. It involves placing merchandise in a pattern following a zigzag line. The arrangement does not require equal height and distance between each level of merchandise.

A ***line arrangement*** involves placing items of merchandise and props in the path of a straight or curved line. Line arrangements are most frequently used when there are only a few units in a display. Line arrangements include the ***S-curve*** (a curving line that zigzags from left to right), ***crescent curve*** (a line that curves in the shape of a crescent), and ***reverse curve*** (a line that curves in the opposite direction of the crescent curve).

Radiation involves arranging related items in direct lines from a central object or space. The purpose of a radiation arrangement may be to direct the viewer's vision toward the center of the display or away from the center. A ***pyramid arrangement*** involves arranging items from a broad base and adding items so they rise toward a point. Pyramid arrangements are most often used to display small merchandise such as canned goods or cosmetics.

Signage Used in Displays

The term ***signage*** refers to the use of signs in retail stores to present a merchandise theme, introduce a fashion trend, provide the background of a product, explain why a product is desirable, and emphasize other important points. Each retail store has its own philosophy about the use of signs. ***Descriptive signs*** are signs used to describe merchandise. Signs should be compatible with the look and theme of displays.

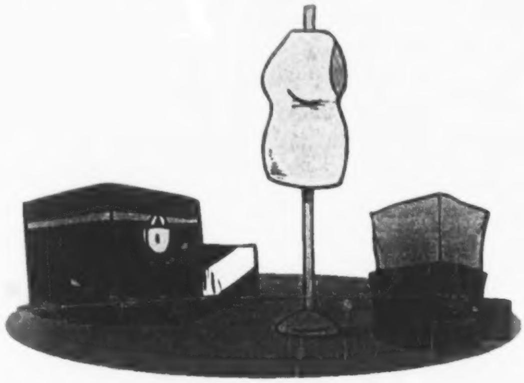
Signs should be professionally prepared. Some large retail stores have sign shops in their stores where professionals prepare signs. The most recent trend in signage is for stores to contract with professionals outside the store to prepare signs. This arrangement prevents the expense of hiring full-time professionals to prepare signs. In addition, some manufacturers provide professionally prepared signs for retail stores who sell the manufacturers' merchandise. Exclusive shops tend to use less signage than other retail stores.

An effective sign is informative, is accurate, is appropriate for the display, follows a set pattern, and does not contain too much information. The information provided on a sign may include the name, the price, and important descriptive information. For example, a sign describing children's overalls may include phrases such as "sizes 2 to 8" and "adjustable straps" in addition to the price and item name.

The overall look of a sign should be compatible with the type of display in which it is used. If the look of a particular display is casual, the lettering on the sign and the colors used on the sign should complement the overall look of the display. A large display may require a large sign while a small display requires a smaller sign. All of the signs in a department or area should complement each other to create a pattern. It is important to visualize each department or area in a store as a customer views it in order to create an appropriate image for the store. A sign should not contain too much information because the intended message becomes lost among unnecessary words. Providing a limited number of well-chosen words and phrases on a sign is better than offering too much information.

Fixtures Used in Displays

Fixtures are items constructed to support and display merchandise. There are various types of fixtures. Stands are used to raise various types of merchandise to eye level. A ***basic display stand*** can be made of metal, wood, or plastic; has a stable, circular base; and has adjustable extensions so it may be raised to different levels. There are many different attachments and tops that screw onto basic display stands for use in displaying various types of merchandise.



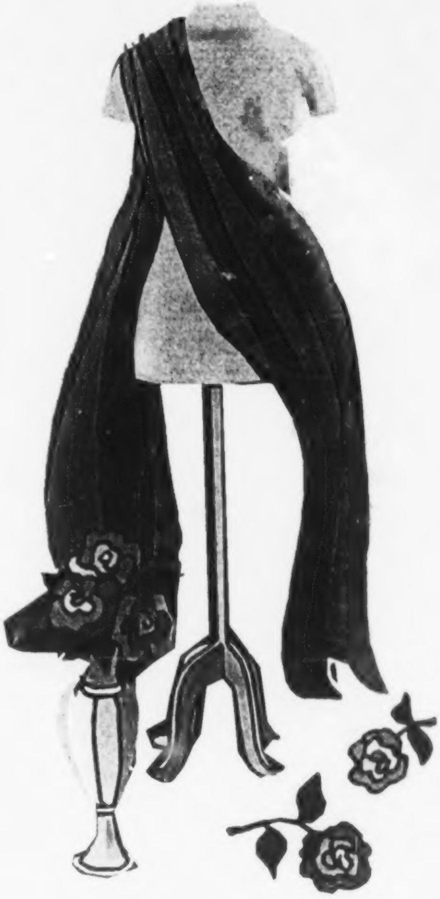
The following types of attachments may be used with a basic display stand to display merchandise:

- ***T-top*** - a straight utility bar attached perpendicular to the display stand. Items such as fabric or scarves may be draped over the bar for display.
- ***garment top*** - curved downward and displays one sweater, blouse, dress, jacket, or other garment
- ***lingerie top*** - curved upward on both ends to keep slips and gowns from sliding off the bar. Shoulder strap handbags may also be displayed on a lingerie top.

- ***shoe top*** - consists of a flat piece of metal and steel pins and is used to display shoes. The shoe top attachment may be tilted at different angles.

In addition to the basic display stand, there are many other types of fixtures used to display apparel. These fixtures are usually used within clothing departments to display multiple apparel items. Some of the most commonly used fixtures are as follows:

- ***T-stand*** - looks like a basic display stand with a T-top attached. T-stands are used on the aisle or in the front of a department. No less than eight items and no more than twelve items should be displayed on one T-stand. Only one type of merchandise should be placed on the stand at once.
- ***tent costumer*** - a variation of the T-stand. It differs from the T-stand in that the bar attached to each side of the top of the stand is angled downward and has pegs to hold garment hangers. A tent costumer should hold the same number of garments as there are pegs.
- ***tri-rack*** - a display that can be approached from all angles and consists of three sides for display of one type of garment in various colors. A glass top may be added to a tri-rack to show an example of the garment item hanging on the racks or to hold signage.
- ***quad rack*** - available in different heights. The taller units allow two tiers of garments to be hung, one over the other. A multi-shelf Plexiglas(TM) case can be added to the quad rack to display folded merchandise such as men's shirts. The quad rack is used to display men's and women's clothing and is especially useful for separates.
- ***S-rack*** - is adjustable and may be used in an S-shape or in a circular formation around a column. One, two, or three tiers of garments can be hung over each other. ***Waterfall brackets*** are sometimes attached to an S-rack to hang handbags, belts, or jewelry. Waterfall brackets are angular attachments that project outward with hooks that separate and hold items.
- ***pinwheel rack*** - consists of three half-circular units staggered in heights of 78", 66", and 54". The pinwheel rack is especially useful for displaying groups of coordinated garments.



A variety of other fixtures are used to display merchandise and related information. The following items are commonly used in textile and apparel retail businesses:

- ***easels*** - three-legged stands that display items perpendicular to the display area. Easels may be made of metal, plastic, wood, rubber, or wire. They may be used to display merchandise or signage.
- ***millinery heads*** - fixtures designed to display hats. They may be adapted for use in displaying necklaces and scarves. Some

millinery heads resemble the human head while others are more abstract. A millinery head has a stand to support the head.

- ***forms*** - designed to replicate the human body or parts of the body. They are designed to display women's, men's, and children's clothing. Some forms are full-figured. These forms are often called ***mannequins***. ***Appendage forms*** are reproductions of arms, hands, or legs used to display items such as gloves, shoes, and hosiery. Some forms include only the torso without heads or appendages (arms and legs). Women's blouses and men's shirts and jackets are often displayed on these forms.
- ***platforms*** - As previously described, a platform is an elevated stage on which items are displayed. The platform serves to raise the merchandise for viewing and prevents handling of merchandise.
- ***displayers*** - hung as panels from the ceiling to serve as the background for a display or to separate groups of merchandise.
- ***set-pieces*** - include display items such as small statuettes, foliage, or commonly used objects such as telephones. Set pieces serve as props in carrying out a display theme.

◆ Essential Questions: ◆ Display Arrangements, Signage, and Fixtures

1. What are seven basic types of display arrangements? Describe each.
2. What characteristics help make display signage effective?
3. What are five examples of fixtures used to display textile and apparel products? How is each used?

Chapter Highlights

☆ Display is a nonpersonal physical representation of merchandise or ideas at the point of sale.

☆ Visual merchandising refers to various methods used to make a business attractive and efficient in selling merchandise.

☆ The responsibility for creating displays is assigned to different employees. In small businesses, employees not specifically trained in visual merchandising may have display responsibilities. In larger stores, employees are hired who specialize in display.

☆ Window displays promote sales by showing customers available merchandise. The major categories of window displays are selling displays and prestige displays.

(Continued on page 168)

Chapter Highlights

(Continued from page 167)

- Various types of window displays include single-category displays, campaign window displays, single-promotion displays, sale displays, line-of-goods displays, and mass displays.

- Responsibilities related to window displays are assigned by different methods including the departmental method and rotation method. Most stores change their window displays once each week.

- Types of windows used for displays include the open window, closed window, and semi-closed window.

- Components used in window displays include merchandise, functional props, decorative props, structural props, background, floor covering, and lighting.

- Interior displays are used in combination with window displays and advertising to create image and personality for a business. Interior displays should be located where customers will see them.

- Types of interior displays include showcase displays, counter displays, displays on platforms, displays in shadow boxes, environment displays, island displays, displays in free-standing units, hanging displays, point-of-purchase displays, self-selection displays, and video kiosks.

- The elements and principles of design are used in designing effective displays.

- Various arrangements may be used in developing displays including the single-unit, repetition, step, zigzag, line, S-curve, crescent curve, reverse curve, radiation, and pyramid arrangements.

- Signs should be professionally prepared. An effective sign is informative, is accurate, is appropriate for the display, follows a set pattern, and does not contain too much information.

- Various types of fixtures are used in constructing displays. Fixtures are items constructed to support and display merchandise.

Chapter 12

Selection of Fabrics and Notions for Garment Design

Chapter Focus

The following Essential Knowledge and Skills are discussed in this chapter:

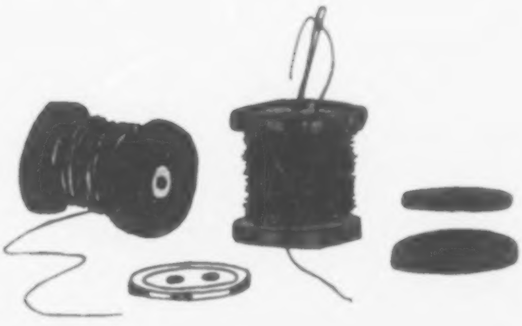
4B Outline general procedures and equipment used in apparel design and pattern development.

4C Analyze factors to consider when selecting fabrics for garment design and production.

Chapter Vocabulary

border print
bottomweights
fabrication
fashion fabric
gigging
grain
hand
interfacing
interlining
lining
motif
nap
napped fabrics
notions
one-way print
pile fabrics
raising
repeat
shaping fabrics
sueded fabrics
topweights
two-way prints
underlining
weight
with nap
yardage

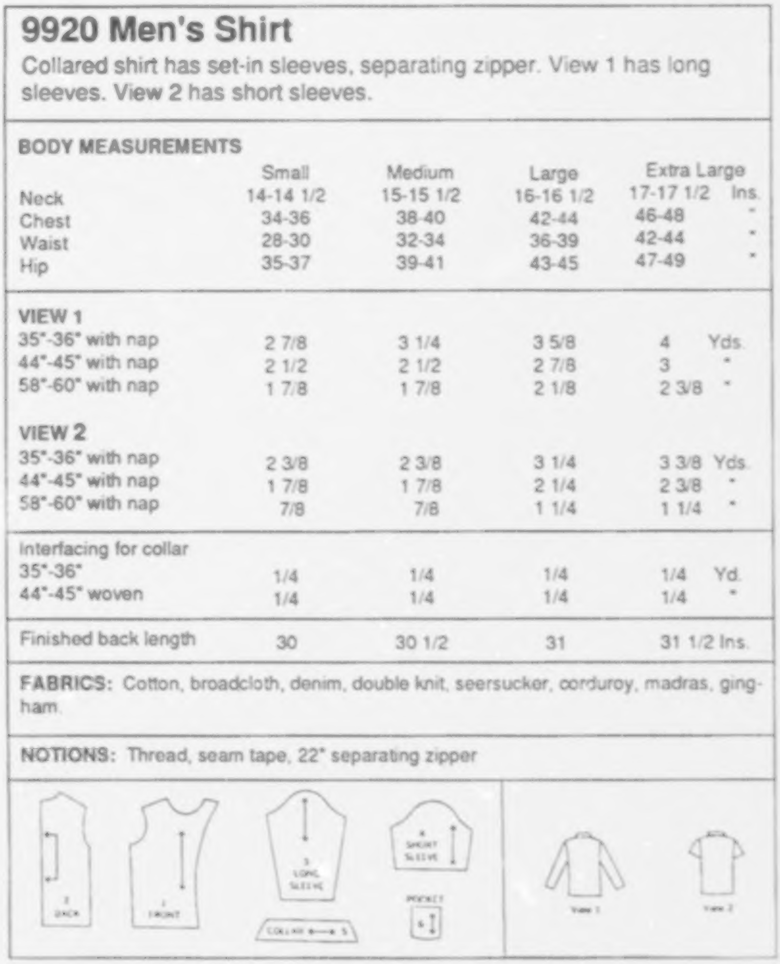
Fabrics are important components of a variety of products. Fabric selection is especially important when designing and constructing apparel. As defined in Chapter Six, fabric is cloth made from any textile fiber by a construction method such as weaving or knitting. Notions are also important components of apparel design. ***Notions*** are items other than fabric that are used in garment construction, such as thread, buttons, buckles, trim, elastic, tape, and zippers.



Since the entire look of a garment results from all of its components, fabric and notions are important influences on each garment. Fabrics and notions are chosen based on fashion trends, quality, performance, price, and suitability. Fashion trends involve certain looks that are popular at a particular time. Quality is an important consideration so that the life of each garment is extended and the person enjoys wearing the garment as long as desired. Understanding how specific fabrics and notions perform is necessary in order to ensure that the fabric and notions selected are suitable for the garment design. The price of fabrics and notions is another important factor.

SELECTION OF FABRIC FOR APPAREL

Fabrication involves selecting or creating an appropriate garment style for a fabric or selecting the right fabric for a garment design. Selection or creation of fabric is one way a fashion designer communicates artistically. Custom sewers and salespeople also use their creative abilities to help customers select fabric and garment designs. Information on fabrics recommended for the garment design is placed on the back of each commercial pattern envelope. These recommendations are useful because they give the custom sewer clues regarding the weights and types of fab-



9920 Men's Shirt

Collared shirt has set-in sleeves, separating zipper. View 1 has long sleeves. View 2 has short sleeves.

BODY MEASUREMENTS	Small	Medium	Large	Extra Large	
Neck	14-14 1/2	15-15 1/2	16-16 1/2	17-17 1/2	Ins.
Chest	34-36	38-40	42-44	46-48	"
Waist	28-30	32-34	36-39	42-44	"
Hip	35-37	39-41	43-45	47-49	"
VIEW 1					
35"-36" with nap	2 7/8	3 1/4	3 5/8	4	Yds.
44"-45" with nap	2 1/2	2 1/2	2 7/8	3	"
58"-60" with nap	1 7/8	1 7/8	2 1/8	2 3/8	"
VIEW 2					
35"-36" with nap	2 3/8	2 3/8	3 1/4	3 3/8	Yds.
44"-45" with nap	1 7/8	1 7/8	2 1/4	2 3/8	"
58"-60" with nap	7/8	7/8	1 1/4	1 1/4	"
Interfacing for collar					
35"-36"	1/4	1/4	1/4	1/4	Yd.
44"-45" woven	1/4	1/4	1/4	1/4	"
Finished back length	30	30 1/2	31	31 1/2	Ins.

FABRICS: Cotton, broadcloth, denim, double knit, seersucker, corduroy, madras, gingham.

NOTIONS: Thread, seam tape, 22" separating zipper

Figure 12.1

rics that might be appropriate. The custom sewer or salesperson can help a customer by suggesting other fabrics with similar properties as the recommended fabrics. Figure 12.1 is an example of the back of a pattern envelope for use while reading this chapter.

Sometimes, fabrics inspire garment designs. For example, a beautiful, soft fabric might inspire selection or creation of a garment design that has gathers. Some fashion designers select the fabric first and then create garment designs that are compatible with the fabric. Other designers tend to create garment designs and then choose fabrics that complement the identified designs. In any situation, the designer or custom sewer must imagine a garment design constructed in the selected fabric. One gains this ability through observation and experience. Besides understanding the customer's needs, selecting a suitable fabric for a particular garment design may be the most important part of the fashion design process.

Grain of Fabric

When selecting woven fabric to custom sew a garment, it is important to check fabric to see if the grain is straight. ***Grain*** is the direction of the weave in a fabric. Warp and filling yarns should intersect at right angles. When these yarns are at perfect right angles, the fabric is on-grain. Sometimes during the weaving and finishing processes, yarns may be stressed and strained so that they do not lie at right angles. In this situation, the fabric is off-grain.

To check the grain of fabric, the fabric should be folded back on itself, with the selvages matched. If the end of the fabric is torn, the torn end should be exactly at right angles with the selvage. If the fabric is cut across the end, a single crosswise thread is followed to see if it is parallel to the folded line of the fabric and at right angles to the selvage.

If the fabric has a plaid or design at right angles to the selvage, about a yard of fabric should be unrolled from the bolt. One-half yard is folded back, matching the selvages carefully. The design should be parallel to the folded line. If the design on a permanently finished garment is more than one-half inch off-grain, it can never be straightened satisfactorily. Fabrics that are off-grain less than one-half inch can usually be straightened. It is best to avoid purchasing fabrics that are very off-grain because various construction problems result. For example, a skirt may not hang evenly when constructed from off-grain fabric. Jeans sewn from denim that is off-grain may have seams that do not hang straight.

Weight and Hand of Fabrics

Fabric performance refers to the fabric's properties related to wearing and cleaning. Each fabric has specific properties resulting from fiber content, construction methods, and finishes applied. The weight and hand of a fabric are major characteristics that influence how the fabric can be used in garment designs. ***Weight*** is the heaviness or lightness and thinness or thickness of a fabric. ***Hand*** is the feel, body, and the way the fabric falls when draped. As discussed in Chapter Seven, silhouette is the outline of a garment based on the way it is designed. The weight and hand of fabric influence the silhouette of a garment.

In order for a designer or custom sewer to select fabrics wisely, it is important to know how a fabric will perform when used to construct a garment. Fabric must be chosen that is compatible with the desired garment silhouette. Fashion designers attempt to develop specific looks when designing garments. For example, a garment with a tailored look has simple, trim lines. Only certain fabrics such as worsted wools, gabardines, and linens are appropriate fabric choices for tailored garments. From experience, designers have learned that these types of fabrics perform well in tailored garments and have a crisp look. A sheer fabric cannot hold a crisp, molded shape. A stiff fabric cannot drape into a soft gather.

Soft fabrics are used in garment designs that allow the body shape to be seen. Fabrics such as crepe, jersey, challis, and chiffon are soft and work well when used with draped designs. Additional softness may be achieved in a garment design by using design details such as gathers, unpressed pleats, or smocking. Further information on various design details is provided in chapters of this reference book related to clothing construction.

Different types of garments are traditionally made of different fabric weights. For example, blouse-weight fabrics are usually lighter than skirt-weight fabrics or pant-weight fabrics. Apparel manufacturers buy fabrics in specific weights, such as a twelve-ounce wool fabric. Ounces per yard, yards per pound, and ounces per square yard are measurements that express fabric weight. Woolens, worsteds, and fabrics of similar weight made from blends or manufactured fibers are often measured in ***ounces per yard***. For example, there are fabric weights such as fourteen-ounce tweed and twelve-ounce worsted. Using this system, the higher number indicates a heavier fabric.

Yards per pound is a measure of the number of yards of fabric in one pound. Using this measurement system, higher numbers indicate fabrics that are lighter in weight. Cottons, cotton blends, and lightweight manufactured fabrics are measured using this system. One does not consider the width of the fabric when measuring ounces per yard or yards per pound. These measurements are, therefore, not as accurate as the measure of ounces per square yard. Using the ***ounces per square yard*** measuring system, the weight of a piece of fabric measuring 36 inches by 36 inches is calculated.

Fabrics are grouped into different categories according to weight. Very lightweight fabrics are fabrics that weigh less than one ounce per square yard. Examples include sheer curtain fabrics, gauzes, and mosquito netting. Relatively lightweight fabrics are fabrics that weigh from two to three ounces per square yard. In the textile and apparel industries, these fabrics may also be called ***topweights*** and are frequently used for shirts or blouses. Medium-weight fabrics weigh five to seven ounces per square yard. These fabrics are commonly used for items such as skirts and slacks. Heavyweight fabrics range from nine to eleven ounces. Very heavyweight fabrics weigh over fourteen ounces. These fabrics are used for cold-weather clothing such as suits and coats. Medium and heavyweight fabrics are sometimes referred to as ***bottomweights***.

Different fabric weights are chosen for different seasons of the year. Light, cool fabrics are used for summer clothing, and heavier fabrics are used to make warm clothes for winter weather. Some fibers are traditionally used for certain seasons. For example, wool is used for many fall and winter clothes because it is heavy, bulky, and warm. Cotton is often used for warm weather because it is an absorbent, cool fabric. In recent years, manufacturers have developed fabrics that can be worn in any season. Some traditionally warm-weather fibers, such as cotton, have been used to construct bulkier fabrics for fall and winter garments. Some traditionally cold-weather fibers, such as wool, have been used to construct lightweight fabrics for spring.

Fabric Patterns and Prints

Fabrics are constructed in a variety of colors, patterns, and prints. A ***motif*** is one design printed on a fabric. When selecting patterned fabric, select a fabric with a pattern that is scaled (sized) appropriately to complement the design of the garment. If a fabric has large motifs, the fabric should be used with a simple design that allows the pattern to be seen. A large-patterned fabric may lose its appeal when cut into many pieces. Matching certain types of designs in fabrics may be impossible. Some garment designs are not suitable for obvious slanting, plaid, or striped fabrics. A complicated garment design with many seams and other details would not allow a large pattern in the fabric to be the most important element of the garment. If a garment design does include important structural lines and details, it is important that the fabric selected be plain and of secondary importance.

Some fabrics have large plaid designs and irregular stripes. Such patterns must be matched when sewing seams together. Fashion designers must recognize fabrics that will require matching of patterns. Matching patterns increases the cost of producing garments. The ***repeat*** of a print is the amount of fabric necessary for a floral or geometric pattern (such as a plaid) to duplicate itself totally. A fabric with a large repeat requires the most yardage because it is difficult to match motifs and patterns.

One-way prints are fabrics with designs printed so that the motif faces only one direction. When using one-way prints, one must cut pattern pieces in the same direction. ***Two-way prints*** are those that have motifs facing both directions. Two-way prints allow pattern pieces to be cut in both directions so cutting is simpler and fabric is saved. A ***border print*** is a fabric that has a printed or woven pattern near the edge of the fabric. The use of border prints must be planned carefully so that the fabric is not wasted and so that the fabric design complements the design of the garment.

Napped, Sueded, and Pile Fabrics

Napped fabrics and ***sueded fabrics*** are fabrics that have textured surfaces as a result of fiber ends being brushed up onto the surface of the fabric. ***Pile fabrics*** are fabrics with cut or uncut loops that stand up densely on the surface. Careful planning is important when these fabrics are used for garment construction.

Sueding develops a very low pile on the surface of the fabric, which causes the surface to look and feel like suede leather. An abrasive material much like sandpaper is used to achieve the suedelike texture. Napped fabrics also have a pile or nap on the surface of the fabric but the nap is deeper.

Nap is created on fabric by rubbing the surface of the fabric with a rough instrument. Napped fabrics are usually made from yarns with a loose twist so that the surface fibers can be brushed up easily. Today, napping is done with machines that have small, fine wires. These small wires catch fibers and pull them up to the surface of the fabric. A soft, fuzzy layer of fibers is formed on the surface. The terms ***gigging*** and ***raising*** are sometimes used to describe the napping process. Fabrics intended for apparel use are usually napped on one side only. Sometimes, fabrics constructed for use in making blankets are napped on both sides.

Pile fabrics may be created by weaving or through other construction techniques such as tufting or knitting. In woven pile fabrics, an extra set of yarns is incorporated to form the pile. Woven pile fabrics are made using a complex process in which there are at least three sets of yarns. For some fabrics, such as corduroy and velveteen, the extra yarns are cut and brushed up on the surface of the fabric. In some weaving methods, the loops are not cut. Examples include terry cloth and frisé (an upholstery fabric).

Some sueded fabrics have a similar hand and appearance to that of real suede leather. These fabrics are generally used for garments with simple design lines since the fabrics are somewhat bulky. Other sueded fabrics may be more drapeable and have a softer hand. Napped and pile fabrics are frequently used for apparel worn in cool or cold weather. The loose fiber ends trap air to serve as insulation. Sleepwear, coats, and sweaters are often made from napped fabrics. Some pile fabrics such as velvet and velveteen are used for very formal garment designs.

Sometimes, napped and pile fabrics are brushed so that the nap or pile runs in one direction. When this process has been used in constructing a fabric, the fabric is smooth in one direction and rougher in the other direction. Garment pieces cut from such fabrics must be placed on the fabric so that all pieces are laid in the same direction. If two pieces are cut in different directions and laid next to each other, the light will be reflected differently so that the two pieces appear to be different colors.

Fabrics that Shape Garments

Shaping fabrics are fabrics used to prevent sagging and stretching; to add crease-resistance, firmness, warmth, and body; to create design effects; to strengthen edges; to tailor a garment; or to increase garment life. Shaping fabrics must be compatible with ***fashion fabric***, the fabric from which the garment is constructed. One must select shaping fabrics carefully to achieve the intended purposes. The following guidelines should be followed in selecting shaping fabrics:

- Choose the correct fabric weight. The shaping fabric should be no heavier than the fashion fabric unless a very crisp, stand-up effect is desired.
- Select fabric of the proper finish and texture. The shaping fabric should be similar to the fashion fabric.
- Choose fabric of an appropriate stiffness and flexibility. The shaping fabric should outline the garment or should be suitable for shaping a specific detail.
- Select shaping fabric that cleans and shrinks like the fashion fabric. The amount of shrinkage and the method of care should be the same for the shaping fabric and the fashion fabric.
- Choose a color of shaping fabric that blends well with the fashion fabric. It is especially important to match the two fabrics if the fashion fabric is sheer enough that the shaping fabric shows through it.

To determine the effect of the shaping fabric on the fashion fabric, drape the fabrics together. Feel the two fabrics together to get an idea of the weight and texture. Hold the fabrics up to see how they drape together. Consider how the two fabrics will shape the silhouette and details of the garment.

Shaping fabrics are used in garments as interfacing, lining, underlining, or interlining ***Interfacing*** is a piece of shaping fabric used to shape a garment section. It is placed between the facing and the garment to add firmness to the section and to help it retain its shape. Interfacing usually is used along garment edges, collars, and cuffs. Interfacing fabrics can be light, medium, or heavy in weight. They can be woven, nonwoven, or knitted. Some interfacing materials are fusible. Fusible interfacing can be ironed onto the fashion fabric, underlining, or garment facing. Fusible interfacing tends to add rigidity to the garment fabric. Interfacing fabrics should give support and body without dominating the garment fabric.

Lining adds shape and wear to a garment and provides a finished look inside the garment. Lining is constructed separately from the garment and is then attached to the garment. Lining fabrics are usually smooth, durable, lightweight enough that they do not interfere with the hang of the garment, and opaque enough so the inner construction of the garment will not show through. Pile fabrics, quilted fabrics, and satin-backed, insulated fabrics are sometimes used for lining in order to add warmth. The weight, color, and care of the lining fabric should be compatible with that of the fashion fabric. An anti-static finish is a desirable feature in lining fabric.

Underlining is used to add shape, crease-resistance, and wear to a garment. Each piece of the garment cut from fashion fabric matches a piece cut from underlining fabric. One piece of the garment fabric and one piece of the underlining fabric are placed together and treated as one during garment construction. Fabrics sold for underlinings can be light to medium in weight with soft, medium, or crisp finishes. Fabrics such as china silk, organdy, organza, muslin, or lightweight tricot (for knits) can be used as underlining. Underlining fabrics should be stable and lightweight. The finish (softness or crispness) of underlining fabric should be appropriate for the desired effect of the garment.

Interlining is used to add shape and warmth to coats or jackets. It is used in the body of a winter coat or jacket and sometimes in sleeves. It is often omitted in the sleeves to reduce bulk. Interlining is cut in the shape of a lining section and is placed between the lining and the garment fabric. The interlining is constructed separately and then catch-stitched (loosely, hand stitched) to the garment facing before the lining is sewn into the garment. Example interlining fabrics are lamb's wool, felt, flannel, polyester fleece, and lightweight blanket fabric. The fabric selected for interlining should be lightweight, provide warmth, not be too bulky, and have care requirements compatible with the fabric chosen for the garment.

Estimating Yardage

Salespeople in fabric stores and departments must be aware of methods for estimating yardage. Customers often ask salespeople for help in estimating the amount of fabric needed for their sewing projects. Custom sewers must also estimate yardage. ***Yardage*** is the amount of fabric needed for a particular sewing project. Fabrics are sold in different widths ranging from 25 inches to 72 inches. Since more pattern pieces can be placed on wider fabric, less yardage is needed for wider fabrics. When sewing with a pattern, it is best to use the chart on the back of the pattern envelope to estimate the amount of fabric needed. Refer to figure 12.1 for information found on the back of a pattern envelope.

Several views (illustrations) of the garment design appear on the front of each pattern envelope. Each view is slightly different. For example, one view may show the garment without sleeves while another view may illustrate the garment with long sleeves. The different views allow the sewer to be creative and adjust the garment design for his or her preferences.

To estimate required yardage, select the pattern size and view to be sewn. Then, identify the width of the selected fabric. Notice the terms "with nap" or "without nap" on the pattern envelope chart. ***With nap*** refers to any napped, shaded, pile, or one-way print. As mentioned previously, these fabrics require the pattern pieces to be laid facing in the same direction. This type of layout usually requires extra yardage. The need for extra fabric depends on the shapes of the pattern pieces. If top and bottom widths are about the same, no extra yardage is necessary. When the top and bottom widths of a pattern piece differ considerably (as in a widely flared skirt), an extra 1/4 yard of fabric should be purchased for each yard of fabric specified. When uncertain about how much yardage is needed, place the major pattern pieces on fabric that is laid on a cutting table.

To read the chart on the back of a pattern envelope, locate the fabric width and pattern view desired. Look horizontally across the chart to find the column for the correct pattern size. The amount given is the amount of fabric needed. Check to see if contrasting fabric, interfacing, lining, elastic, or trim is required for the garment view selected. If these items are required, note the width of the fabric selected and the amount required for the garment size to be sewn.

Sometimes the pattern does not specify yardage requirements for special fabrics. Some fabrics, such as plaids, stripes, and diagonals, must be matched at the seams during construction. Other fabrics, such as large-scale prints, border prints, and lace, may require special design placement. For these types of fabrics, the length of one repeat should be added for each yard of fabric required. For example, if two yards are required and the repeat is 4 inches, 2 1/4 yards of fabric are needed.

Sometimes fabric is available in a width that is not listed on the pattern envelope chart. Usually, it is best to buy the amount shown for the width nearest to the width of the fabric selected. Some stores use a chart to estimate yardage requirements for different widths of fabrics. Yardage estimate charts do not include changes in fabric requirements caused by pattern alterations, large-scale fabric designs, directional fabrics, or garment designs with unusual shapes or large pieces. Therefore, the person making fabric purchases should estimate extra yardage to allow for these situations.

Table 12.1 is an example of a fabric width conversion chart. To use the chart, find the yardage estimate on the pattern envelope for the fabric width nearest the width of the fabric selected for the sewing project. Use that estimate as the width to locate at the top of the chart. Look down the column to find the yardage requirement given on the pattern envelope. Look horizontally across the same line to the width of fabric selected. This amount should provide enough fabric for the project. The chart only gives an estimate. If a customer has doubts about how much fabric to purchase, the customer should be encouraged to make the final decision.

Fabric Width Conversion Chart

Fabric Width Yardage	32"	35"/36"	39"	41"	44"/45"	50"	52"/54"	58"/60"
	1 7/8	1 3/4	1 1/2	1 1/2	1 3/8	1 1/4	1 1/8	1
	2 1/4	2	1 3/4	1 3/4	1 5/8	1 1/2	1 3/8	1 1/4
	2 1/2	2 1/4	2	2	1 3/4	1 5/8	1 1/2	1 3/8
	2 3/4	2 1/2	2 1/4	2 1/4	2 1/8	1 3/4	1 3/4	1 5/8
	3 1/8	2 7/8	2 1/2	2 1/2	2 1/4	2	1 7/8	1 3/4
	3 3/8	3 1/8	2 3/4	2 3/4	2 1/2	2 1/4	2	1 7/8
	3 3/4	3 3/8	3	2 7/8	2 3/4	2 3/8	2 1/4	2
	4	3 3/4	3 1/4	3 1/8	2 7/8	2 5/8	2 3/8	2 1/4
	4 3/8	4 1/4	3 1/2	3 3/8	3 1/8	2 3/4	2 5/8	2 3/8
	4 5/8	4 1/2	3 3/4	3 5/8	3 3/8	3	2 3/4	2 5/8
	5	4 3/4	4	3 7/8	3 5/8	3 1/4	2 7/8	2 3/4
	5 1/4	5	4 1/4	4 1/8	3 7/8	3 3/8	3 1/8	2 7/8

Table 12.1

◆ Essential Questions: Selection of Fabric for Apparel ◆

1. What is the difference between fabric that is on-grain and fabric that is off-grain? Why should off-grain fabric be avoided?
2. How is the grain of fabric checked?
3. How do the weight and hand of fabrics influence their performance?
4. What three different measurements are used to express fabric weight?
5. What categories are used to group fabrics by weight?
6. What should be considered when selecting fabric that is patterned or printed?
7. How are napped, sueded, and pile fabrics made? What should be considered when purchasing napped, sueded, or pile fabrics to construct a garment?
8. Why are shaping fabrics added to some garments? In what different ways are shaping fabrics used?
9. How should a salesperson assist a customer in estimating yardage for construction of a garment?

SELECTION OF NOTIONS FOR APPAREL

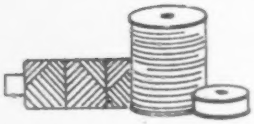
Notions, additional items that are part of a garment besides fashion fabric, are important components of apparel. Notions include a variety of items such as thread, buttons, buckles, elastic, hooks and eyes, snaps, trims, and tape. In mass production of apparel, large quantities of notions are purchased by the manufacturer, based on the designer's specifications, for use in construction of clothing designs. In custom sewing, notions are selected to complement individual garments. In both situations, careful selection adds to the quality and appearance of each garment produced. Many of the same considerations should be used in selecting notions as in selecting fabric. Notions are also selected based on fashion trends, quality, performance, price, and suitability.

Custom sewers and salespeople who assist home sewers need experience in selecting notions for construction of apparel. It is usually best to buy all the supplies needed for a project when the pattern and fabric are purchased. This process makes it easier to match colors and speeds completion of the project. The salesperson in a fabric store or department should be familiar with the types, sizes, and locations of sewing notions.

When customers ask for assistance in selecting notions, it is best to first look at the back of the pattern envelope. Check yardage charts for items such as elastic or trim. Check the notions list for sewing supplies required for the selected pattern. Table 12.2 includes a list of various notions and sewing supplies commonly available in fabric stores and departments.

◆ Essential Questions: Selection of Notions for Apparel ◆

1. What factors influence selection of notions for apparel?
2. What notions are required for the pattern depicted in Figure 12.1?
3. What three types of zippers are described in Table 12.2?

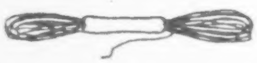


Notions and Sewing Supplies

Thread

Thread is available in sizes ranging from 8 to 100. The smaller the number, the larger the diameter of the thread.

Types	Characteristics	Uses
Basting	Loosely twisted, cotton thread	Hand basting
Button & carpet	Tough, thick cotton or cotton-wrapped polyester thread; usually has a glazed finish; size 16	Hand sewing jobs requiring very strong thread
Darning cotton	Very fine, cotton thread	Darning & mending
Elastic	Thick, very stretchy nylon or cotton-wrapped thread	Gathering or shirring on sewing machine; used on bobbin only
Embroidery floss	Cotton or rayon; six strands loosely twisted together	Embroidery; decorative handwork; strands can be separated
Extra-fine	Cotton, polyester, or cotton-wrapped polyester thread; sizes 60, 70, & 100	Lingerie; work requiring a fine thread
General purpose	Medium-thick cotton thread; available in a wide range of colors; usually mercerized; size 50	Machine & hand sewing on lightweight & medium-weight cotton, rayon, & linen; poor choice for knits or other stretchy fabrics (seams come unstitched)
	Fine, strong, silk thread; size A	Hand & machine sewing on silk & wool, knits, & tailored garments; basting all fabric types
	Fine, strong, nylon thread; size A	Hand & machine sewing on lightweight to medium-weight fabrics made of manufactured fibers
	All-purpose weight polyester thread	Hand & machine sewing on most fabrics, particularly woven fabrics made from manufactured fibers, knits, & stretch fabrics
	All-purpose weight cotton-wrapped polyester	Hand & machine sewing of knits or wovens of manufactured or natural fibers or blends



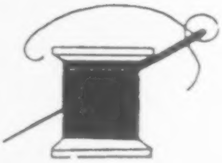


Table 12.2

Thread (continued)		
Types	**Characteristics**	**Uses**
Heavy-duty	Coarse cotton, polyester, or cotton-wrapped polyester thread; size 40	Hand or machine sewing of heavy vinyl, coating, & upholstery fabrics
Metallic	Shiny thread made of nylon; available in a variety of colors	Decorative hand or machine stitching
Quilting	Glazed cotton thread; size 40	Hand or machine quilting
Silk or buttonhole twist	Coarse silk thread; size D	Topstitching; decorative hand sewing; hand-worked buttonholes; sewing on buttons; bobbin gathering thread
Straight Pins Straight pins come in a wide range of lengths & sizes. The size of the pin refers to the diameter or width of the pin. Sizes can vary from size 8 to size 32. The larger the number of the size, the longer & wider the pin is. The pins listed below are available in a variety of sizes & lengths.		
Flat head	Head of pin is flat like a nail	General use
Large head	Glass or plastic ball on one end of pin	General use; easier to see and handle
T-head	Head of pin is shaped like a "T"	Heavy pile fabrics and loose knits
Sharp point	Point of pin is sharpened for easy insertion	General use
Ballpoint	Point of pin is rounded and dull so it does not break threads of fabric upon insertion	Knits and elastic
Hand Needles Hand needles are available in several different sizes. The smaller the number of the size, the longer & wider the needle. Sizes 7-10 are best for most clothing construction. Other sizes are used for heavy fabrics or specialized sewing.		
General	Sizes range from 1 to 24 to accommodate most fabric weights	
Sharp	Sizes range from 1 to 12; medium length; rounded eyes	General sewing of all fabric weights

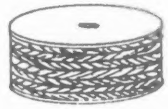


Table 12.2-continued

Hand Needles (continued)

Types	Characteristics	Uses
Between	Sizes range from 1 to 12; short with small, rounded eyes	Heavyweight fabrics; detailed hand sewing that requires short, fine threads
Ballpoint	Sizes range from 5 to 10; rounded points	Knit fabrics
Milliner	Sizes range from 3/0 (000) to 12; long; small eyes	Basting; millinery work
Calyx-eyes	Sizes range from 4 to 8; slot for easy threading	All fabric weights
Needlecraft		Art needlecrafts
Crewels	Sizes range from 1 to 10; sharp; medium-length; long eyes	Embroidery; crewel work with embroidery
Chenilles	Sizes range from 13 to 26; sharp; heavy	Embroidery work with yarn
Beading	Sizes range from 10 to 15; long; thin; flexible	Beading; sequin work
Tapestry	Sizes range from 13 to 26; short; heavy; blunt points; large eyes	Needlepoint; tapestry work
Darning		
Cotton darners	Sizes range from 1 to 9; long; long eyes	Darning & mending with fine cotton or wool; basting
Double longs	Sizes range from 5/0 (00000) to 9; long	Darning large holes
Yarn darners	Sizes range from 14 to 18; long; heavy; large eyes	Darning with heavy or multiple yarns
Heavy-duty sewing		
Glovers	Sizes range from 3/0 (000) to 8; short; round eye; triangular point	Sewing with leather, fur, vinyl, or plastic
Sailmakers	Sizes range from 14 to 17; triangular point extending part way up the shank	Canvas; heavy leather
Curved needles	Sizes range from 1 1/2" to 3"; may be double-pointed; coarse, semicircular; oval eyes	Upholstery; braided rugs; lampshades; tasks where a straight needle is difficult to use

Table 12.2-continued

Machine Needles

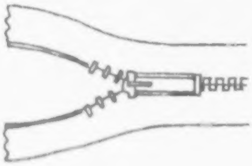
Sewing machine needles are made of steel. They are used to carry the thread through the machine while stitches are being formed. Machine needles are available in different sizes, types, & classifications. Machine needles are used for home sewing & industrial sewing.

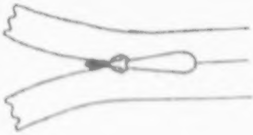
Types	Characteristics	Uses
Fine	Size 9; smallest needle	Lightweight fabrics
Medium	Sizes range from 11 to 14	General machine sewing
Heavy	Size 18; largest needle	Heavyweight fabrics
Points	Sizes range from 9 to 18	Woven fabrics
Ballpoint	Sizes range from 9 to 16	Knit & elastic fabrics
Wedge-shaped	Sizes range from 11 to 18	Leather & vinyl

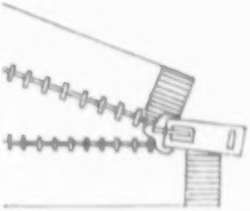
Fasteners

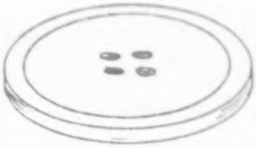
Fasteners can be used for decorative or functional purposes. When used for a functional purpose, fasteners hold sections of a garment together, in place, or closed. The type of fastener used depends on the characteristics of the garment.

Zippers		
Regular/ conventional	Exposed teeth; chain or coil; open at top; held together at bottom; many different styles & sizes	Long seams; centered, lapped, exposed, or fly methods of zipper insertion
Invisible	Hidden in seam; may require special zipper foot for particular brand; available in light to medium weights; chain or coil structure; lengths range from 7" to 22"	Skirts & dresses; anywhere conventional zippers are used except in trouser plackets
Separating	Open at both top and bottom; zipper opening separates completely; reversible or two-way	Jackets; any garment with a front opening; centered application method
Buttons		
Shank	Sizes range from 1/4" to 2"; sizes indicated by the numbers 18-80; solid top with a shank which is sewn to the garment	Thick fabric
Sew-through	Two or four holes used to sew on the button; thread shank can be added if necessary	Fabric of any weight









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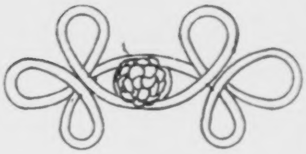
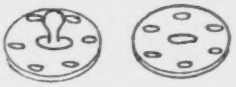
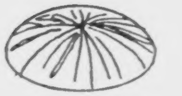
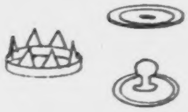
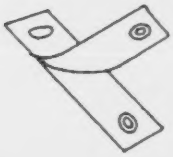
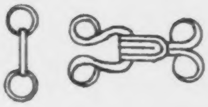


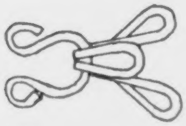


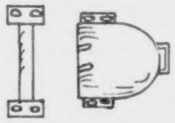


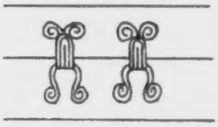










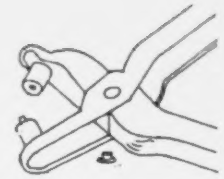


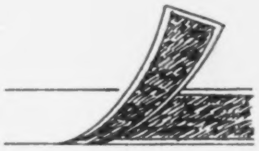
Fasteners (continued)

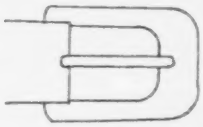
Types	Characteristics	Uses
Frogs	Sizes range from 2 3/4" to 4"; made of braid with a Chinese ball button	Decorative closings
Snaps		
Regular	Sizes range from fine (4/0) to heavy (4); two-part fasteners with a ball part and a socket part which push together; nickel or black enamel finish and clear nylon	Garment parts that receive little stress; hold parts together
Covered	Sizes range from 2 to 4; heavy; neutral-colored; fabric-covered regular snaps	Garment areas where snaps will be seen
No-sew snaps	Socket & ball fasteners; held in place by pronged rings; mostly heavy sizes	Areas needing good holding power; children's clothes, sportswear, pajamas, work clothes; decorative closures
Snap tape	Regular or no-sew snaps attached to cotton or tricot tape; sold by the yard or in precut lengths	Multiple snap application
Hooks & Eyes		
Regular	Sizes range from fine (0) to heavy (3); nickel or black enamel finish; eye may be a straight bar or a loop attached to a base	Lapped edges or edges that meet
Covered	Large; neutral-colored; covered with a series of stitches that conceal the metal	Coats; jackets; garments made of deep pile fabric or fur
Waistband	Extra-large; sturdy; nickel or black finish; special design keeps hook from slipping off the straight eye	Waistbands on skirts or pants
Hook & eye tape	Neutral-colored medium hooks & loop eyes attached to cotton tape	Multiple hook & eye application; lapped or centered application

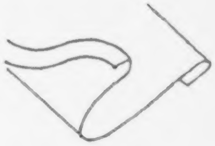
Table 12.2-continued

Fasteners (continued)		
Types	**Characteristics**	**Uses**
Eyelets	Round metal reinforcements applied with special pliers; made of nickel or gilt-finished aluminum or enameled brass; sold in packages	Holes in belts & laced closures
Loop & pile fastener/ hook & loop tape	Two fasteners interlock when pressed together; one fastener has a soft, fuzzy surface & the other has small, plastic loops; available in strips, circles, squares, & other shapes of varying sizes	Garment details such as shoulder pads, cuffs, & detachable trims & collars; closures in garments made for children & physically impaired people; accessories such as belts and children's shoes; good substitute for other closures in home decorating, particularly upholstery
Buckles	Gold or silver-finished metal, plastic, bone, wood, leather, or custom-buckle kits with or without a prong in a variety of styles and widths from 1/2" to 3"; available singly or in kits with belting	Belts; decorative tabs or straps
Tapes Tapes are strips of braided, woven, or knitted fabric or lace. Some tapes are functional while others are used for decoration. The function of the tape should match the function of the garment.		
Hem facing	Flexible tape 2" wide; available in an assortment of colors; cotton, taffeta, or decorative lace with edges folded in about 1/4"	Hem facing when garment is lengthened; eliminating bulk from hem in heavy fabric; making a casing; binding facings
Bias tape	Fabric strips of varying widths, (1/2", 1", & 1 1/4") with pre-folded edges; may be single-folded with edge folded to center, or double-folded with an additional fold just slightly off-center	Curved hems; casing; binding
Seam binding	Straight woven or lace tape in 1/2" & 3/4" widths in prepackaged lengths; needs pre-shrinking to prevent woven type from puckering	Hemming edges; woven type used to stay seams; lace type is ideal for knits









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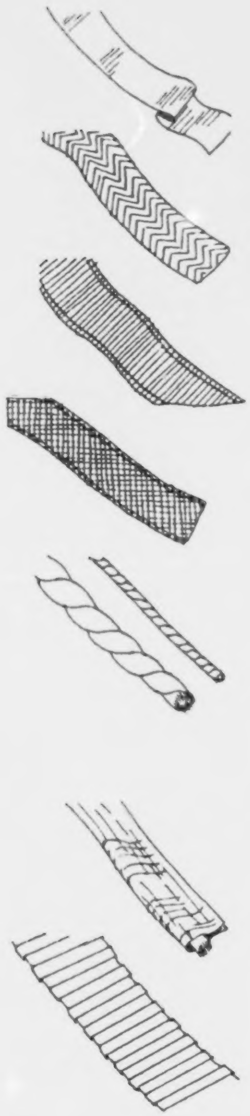


Tapes (continued)

Types	Characteristics	Uses
Blanket binding	Acetate satin; made on the straight grain; available in 2" and 2 7/8" folded widths	Binding blanket edges
Twill tape	Woven, stable tape; made of black or white cotton twill; available in widths of 1/4", 1/2", 3/4", and 1"	Staying and strengthening seams and waistlines; tailoring
Grosgrain ribbon	Heavy silk or rayon ribbon; narrow horizontal ribs; available in various colors; widths range from 3/16" to 3 1/8"	Finishing or staying a waistline
Horsehair braid	Stiffening made from transparent nylon strands; widths range from 1/2" to 6"; may have presewn ease thread along one edge	Finishing the bottom of hems to emphasize the flare of the skirt; long evening wear
Cording	White cotton, cellulose, or synthetic cord; sold by the yard; thicknesses range from 1/16" to 1"; sizes range from 40 to 300; fine to heavy	Cording; corded buttonholes; tubing

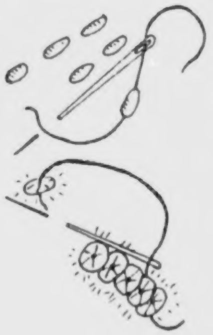
Trims

Trims are used to adorn & finish garments & accessories. Trims include items such as braids, ribbons, beads, & laces. Many different types, sizes, & colors of trims are available. Some trim types are made especially for different methods of application.

Corded piping	Precorded 1/8" bias strip; one edge is welted; 1/4" seam allowance; available in many colors; prepackaged lengths	Piping, decorative edge trimming, decorative finish for faced edges and seams
Ribbing	Knitted, stretchy, decorative bands available in various widths and designs; available packaged or by the yard	Quick finish & color accent for neck and wrist edges; waistline insets; edgings
Lace	Openwork cloth with a design formed by a network of threads; available in various colors, widths, & types	Decorative edging; decorative inserts; gathered trim
Edging	One decorative edge & one straight edge	Decorative garment edges

Table 12.2-continued

Trims (continued)		
Types	**Characteristics**	**Uses**
Galloon	Two scalloped edges	Banding; border; insertion
Insertion	Two straight edges for insertion between two pieces of fabric	Sheer effect between two cut edges of fabric
Beading	Slots through which ribbon can be threaded	Decorative effects
Embroideries	Thread designs worked over a fabric base; types include blindwork, novelty, & eyelet	Decorative trims stitched by hand or machine
Appliqués	Individual motifs; embroidered thread design on a fabric base	Trimming small areas
Ribbons	Grosgrain or satin ribbon; available in varying widths, designs, & colors; sold by the yard; better quality ones are made on a jacquard loom	Trim
Medallions	Attached to form a chain; can be cut apart & used as appliqués	Decorative shapes; edging; appliqué; borders
Fold-over braid	Finished edges; folded in half; sold by the yard; available in various colors & designs	Borders; edging; outlining design; creating decorative shapes
Bands	Knitted or woven; may be prefolded; straight grain or bias; available in a wide range of widths & colors	Finishing edges; design outlines; decorative shapes
Ropes	Flexible cord; formed by twisting, braiding, or covering a cord with fabric	Trim; belts
Beads	Individual or prestrung; prepackaged beads available in several shapes & a variety of colors	Motif outlines; creating designs
Sequins	Small, shiny disks; available prepackaged in several sizes & a variety of colors	Decorative designs



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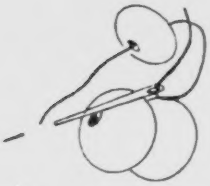


Trims (continued)		
Types	**Characteristics**	**Uses**
Paillettes	Shiny, shaped spangles; larger than sequins	Ornaments on sewn projects
Pre-beaded or sequined bands	Beads or sequins attached to a series of thread chains or elastic backing	Evening looks; costumes
Glitters	Trims with shine, luster, & sparkle; may have metallic threads, sequins, beads, and paillettes	Evening looks; costumes
Shaping Aids Shaping aids are materials used to stiffen or hold the shape of certain areas of a garment. Shaping aids can be used in waistbands, hems, shoulders, & other seams in the garment.		
Waistband stiffenings	Stiff materials attached to waistbands of garments	Gives rigidity to waistlines
Belting	Cardboard-like band; 1/2" to 3" wide; regular and iron-on types available; sold by the yard or in prepackaged lengths	Belt and waistline insert
Professional waistbanding	Nonroll; heat-set stiffener	Inset for belts & waistbands in place of interfacing
Men's waistbanding	Preassembled waistband	Finishing the inside of men's trousers
Boning	Flexible nylon; usually covered with fabric; available in white or black in several widths; sold by the yard or in prepackaged strips	Maintaining & molding shape where stiffness is required
Stays	Metal, plastic, or bone strips in precut widths & lengths	Shaping; molding; vertical reinforcement
Weights	Sizes range from 3/4" to 1 1/8"; available in a variety of metals	Controlling drape of fabric
Lead pellet/ lead disk	Strips of lead pellets or square or round disks; pellets are sold by the yard; pellets may be covered with fabric; disks come in different sizes	Controlling drape of fabric; preventing a hem area from shifting

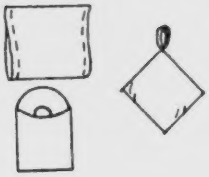
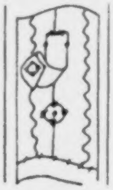


Table 12.2-continued

Shaping Aids (continued)		
Types	**Characteristics**	**Uses**
Chain	A chain available in different weights & lengths; provide decorative weighting	Controlling drape of fabric; obtaining a uniformly weighted hem
Lingerie strap holders	Ends snap together; available in a variety of colors	Holding lingerie straps on the shoulder to prevent showing or slipping
Shoulder pads	Available in dress or coat styles; covered or uncovered; sizes, shapes, & thicknesses dictated by fashion	Padding shoulders of garments; correcting figure faults
Bra pads	Shaped, padded cups; available in several sizes	Evening wear; swimwear
Elastics Elastic is a rubber-core yarn covered with cotton fibers, manufactured fibers, or a blend of fibers. It is available in a variety of colors & can be round or flat, ranging in widths from 1/4" to 1 1/4". Elastic is sold by the yard or in prepackaged lengths.		
Woven	Has less gripping power than braided; does not narrow when stretched	Good for stitching on edges
Braided	Narrows when stretched; used in casings; greater gripping power than woven	Used in casings for waist-bands & other tight-fitting areas
Fusibles Fusibles are functional or decorative items that adhere to fabric when heated. Heat causes the fusible material to soften & adhere to fabric. Fusible material can be used on appliqués, patches, hem tape, & zippers.		
Patch iron-ons	Adhesive-backed fabrics; pressed onto the garment fabric; available in many forms for many purposes	Mending, repairing, or strengthening stress areas; decorative effects
Fusible web	Sold by the yard or in precut lengths; bonding agent that is melted between two layers of fabric	Joining two layers of fabric; hems; facings; appliqués; trims



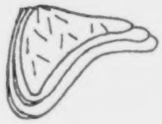


Table 12.2-continued

Chapter Highlights

- Fabrics and notions are important components of garments. Fabrics and notions are chosen based on fashion trends, quality, performance, price, and suitability.
- Fabrication involves selecting or creating an appropriate garment style for a fabric or selecting the right fabric for a garment design. Fashion designers, custom sewers, and salespeople must have knowledge of fabrics and notions that are suitable for use with different garment designs.
- The grain of woven fabric should be checked before the fabric is purchased. Grain is the direction of a weave in a fabric. If the warp and filling yarns intersect at right angles, the fabric is on-grain. If the yarns are not at right angles, the fabric is off-grain. Use of off-grain fabrics causes various construction problems.
- The weight of a fabric is the heaviness or lightness and thinness or thickness of the fabric. Hand is the feel, body, and the way the fabric falls when draped. Both the weight and hand of a fabric influence the silhouette of a garment constructed from that fabric.
- Fabric weights are measured in ounces per yard, yards per pound, and ounces per square yard. Fabrics are grouped into different categories according to weight. Fabrics of different weights are appropriate for use in constructing specific types of garments. Different fabric weights are also chosen for different seasons of the year.
- Fabrics are constructed in a variety of colors, patterns, and prints. Fabrics with prints that are scaled appropriately should be selected to complement the design of the garment. Large prints should be used with simple designs. Small prints and solid colors may be used with garments that have more design details.
- Napped, sueded, and pile fabrics have nap and usually require more yardage than other fabrics. Nap is created on fabric by rubbing the surface of the fabric with a rough instrument. In some cases, the fabrics are then brushed so that the nap runs in one direction. Therefore, all pattern pieces must be laid facing one direction when constructing garments from these fabrics.
- Shaping fabrics are used in addition to fashion fabric for construction of some garments. Shaping fabrics are used for interfacing, lining, underlining, and interlining.

(Continued on page 189)

Chapter Highlights

(Continued from page 188)

- Yardage is the amount of fabric needed for a particular sewing project. Fabrics are sold in different widths. Less yardage is needed for wide fabrics than for narrow fabrics. Refer to information on the pattern envelope and to fabric width conversion charts for assistance in estimating yardage. Extra yardage is usually required for napped fabrics, plaids, one-way prints, stripes, and diagonals.

- Notions includes items such as thread, buttons, elastic, hooks and eyes, snaps, trims, and tape. Careful selection of notions adds to the quality and appearance of each garment.

Chapter 13

Sewing and Repairing Techniques

Chapter Focus

The following Essential Knowledge and Skills are discussed in this chapter:

5D Differentiate procedures and techniques appropriate for varied production systems to achieve quality apparel products.

5E Utilize established production procedures and processes to achieve quality standards in finished products.

6F Utilize appropriate techniques and processes to alter, repair, and customize textile and apparel products according to quality standards.

Chapter Vocabulary

composite garments
draped garments
fit
fitted garment
motion economy
patching
seam
shank
stitch
tailored garments

Read chapter sections for additional terms related to basic sewing techniques and zippers.

Employees apply sewing, repairing, and pressing techniques in apparel manufacturing settings, custom sewing businesses, and alterations and mending businesses and departments. Chapters Thirteen and Fourteen provide basic information about techniques and equipment for sewing and repair tasks. Chapter Fifteen covers basic pressing techniques and equipment.

Experience and skill in sewing, repairing, and pressing can help a person gain employment in the textile and apparel industries. A basic understanding of clothing construction and repair assists employees even if these tasks are not performed daily. For example, a salesperson who understands the characteristics of a well-made garment is more likely to recognize quality in ready-made apparel. In order to perform efficiently in any employment situation, employees must also be able to organize and manage their work, time, and energy well.

As discussed in Chapter Two, various jobs are available that involve the use of sewing, repairing, and pressing techniques. In the area of apparel services, jobs such as alterationist, repairer, presser, custom sewer, and custom sewer's assistant require such skills. In the area of apparel production and management, sewing machine operators, tailors, dressmakers, and tailor's/dressmaker's assistants must use sewing, repairing, and pressing techniques. Of course, fashion designers, sample makers, and other employees in the area of textiles and apparel design must understand basic construction techniques in order to perform their responsibilities well.

WORK MANAGEMENT AND MOTION ECONOMY

Good work methods involve use of the principles of motion economy. ***Motion economy*** means using time saving techniques and being more efficient. By applying motion economy techniques while sewing, repairing, and pressing, an employee in an industrial sewing plant can earn more money by producing more work. Employees in other related occupations can also increase production by accomplishing more work than before within the same amount of time.

The following guidelines outline the basic principles of motion economy as applied to sewing, repairing, and pressing garments.

- Use simultaneous pickup and disposal. Use both hands to perform separate tasks during some parts of the process. Pick up one piece while passing on a completed piece.
- Use simultaneous pickups. When work involves pickup and assembly of two pieces, pick up both pieces at the same time. When the left hand disposes of one piece and the right hand reaches to grasp the next piece, move the left hand to grasp the second piece. Use both hands to pick up, position, and align the work at the sewing machine. Do not use the right hand to pick up and deliver one piece until the left hand is available to deliver the second piece.
- Position work to reduce movements. To save time when picking up two pieces at once, position the piece on the right that will be placed underneath and the piece on the left that will be placed on top. This process eliminates regrasping the pieces.
- Spread out, fold, or handle work in several steps as necessary to position it correctly. Tasks such as matching notches or feeding edges into a second folded piece may be necessary during positioning.
- Eliminate regrasps. Grasp the pieces at the points where they will be assembled. This process prevents regrasping. Notice whether the thumb is on the top or bottom during the grasp, pickup, and delivery. If one or both hands must be repositioned during the task, use a different grasping procedure to save time.
- Grasp pieces with the thumb down on the right hand when sewing long seams. The right hand should have fingers on top and the thumb underneath. This position allows sewing all the way to the point of grasp without stopping.
- Keep the right hand busy. Do not allow the right hand to rest while the left hand guides the fabric under the sewing machine needle. Immediately move the right hand to its next job.
- Attempt to perform another part of the task, such as the pickup or disposal, during the sewing phase to save time.
- Sew with the fewest steps possible. Try to sew long sections of seams without stopping frequently.
- Accomplish work during positioning if possible. For example, fold a corner or turn a seam back during the pickup and position stage so extra steps are not required before sewing. Use both hands efficiently.

- Reduce unnecessary body movements to prevent energy loss. For example, if it is necessary to move the lower part of an arm to complete a task, do not move the upper arm and avoid twisting or turning the body.
- Pick up and dispose of pieces on the same side of the work area. If using both hands to dispose of a piece, perform both pickup and disposal on the left side. This process reduces body movement and allows one to focus vision on the hands and the work.
- Use both feet on the treadle of an industrial sewing machine for best machine control. This method reduces fatigue because the body is in the most natural position for sewing.
- Use the maximum speed possible that allows machine control and quality work. Concentration on working too slowly usually reduces productivity.
- Use the machine treadle brakes. Learn to set the heels firmly on the back of the treadle and make sharp, quick stops instead of coasting to a stop.
- Save time by shortening the distance the hand must travel to pick up work.

◆ Essential Questions: ◆
Work Management and Motion Economy

1. How does use of motion economy principles benefit an employee? How does it benefit the employer?
2. What are five principles of motion economy you might use? How does each principle save time?

THE SEWING PROCESS

There are various types of sewing machines designed for different sewing tasks. Information on these machines is provided in Chapter Fourteen. When using a sewing machine to construct or repair garments, it is important to organize work in order to save time and energy. Garment construction involves the joining of smaller shaped garment pieces together into larger units. Garment repair involves resewing seams, reattaching fasteners, patching holes, and many other procedures used to return a garment to a usable condition. Sewing procedures vary with different operations.

The ***fit*** of a garment refers to how tight or loose it is on the person wearing it. When a garment is the right size and does not pull tightly or sag loosely, it is considered to be a good fit. Garments are designed for different looks and different purposes. A ***fitted garment*** is shaped so that it follows the lines of the body. For many years, there have been three primary methods of making apparel. The methods are the draped, tailored, and composite methods. ***Draped garments*** are those that are wrapped or hung on the body. ***Tailored garments*** are made by cutting garment pieces and sewing them together to fit the shape of the body. ***Composite garments*** are made by combining the tailored and draped methods. Garment parts are cut and sewn. Some garment parts may fit the body closely while others may be draped.

Machine Control

Good machine control means the operator can sew at a desired speed and can start and stop the machine as desired. It also means that the operator can feed materials through the machine evenly and can use the machine to accomplish the tasks for which it was designed.

Sewing machine speed is controlled by the pressure of the operator's foot on the treadle (foot control). The treadle can be controlled with either one or both feet. The ball of the foot controls the speed and the heel controls the break. Less pressure is applied to sew slowly; more pressure is applied to sew fast. The break is pressed to stop the machine. The machine is stopped when the needle is at its highest point unless the work must be turned. Usually, the needle should be at its lowest position to turn a corner. While the needle is in the fabric, the presser foot is raised and the work is turned.

Threading

Every sewing machine has thread guides. The thread must go in, around, over, under, or through these guides in order to deliver the thread at the needle under a specified tension. The machine will probably sew even though one or more thread guides are skipped, but it will not sew as efficiently. If enough thread guides are skipped, the machine will not sew. Skipped stitches and breaking thread are often caused by incorrect threading; therefore, thread guides are the first places to check when these problems occur.

The thread chart in the sewing machine manual of the machine should be studied in order to become familiar with proper threading procedures. The threading instructions should be followed exactly. If a chart is not available, a supervisor should be asked for instructions on how to thread the machine correctly.

When operating an industrial sewing machine, the thread is drawn over the guide that is on the thread stand directly above the spool. This guide helps unreel the thread with the least amount of friction. It is important to thread the needle from the proper direction. Many sewing machine needles are threaded from the side with the long groove. Lock stitch machines and some other types of sewing machines have a bottom thread that comes from the bobbin. It is important to check the bobbin to see that the thread is unreeling properly as part of the threading procedure. Some machines, such as a chain stitch machine, require special tools, such as a threading wire and tweezers, since some threading points are very difficult to reach.

Stitching

A United States Government reference manual, *Federal Standard 751a* (FS751a), defines and classifies seams, stitches, and stitchings. Some apparel manufacturers use these classifications to describe their processes while others do not use them. According to FS751a, a ***stitch*** is a formation of thread used to make a seam. A ***seam*** joins two or more plies (layers) of fabric. Seams are used to fasten together shaped fabric pieces (garment parts) to create garments. Machine stitching is done for both functional and decorative purposes.

The original sewing machines could form stitches only as rapidly as an operator could propel the treadle that turned a balance wheel. Today, fabric is stitched at speeds up to 15,000 stitches per minute (SPM). The speed for stitching depends on the nature of the operation. Long seams can be stitched at full speed as far as the operator can reach without regrasping the work. Sometimes the operator can sew only a few stitches at a time. One must be very skilled to machine stitch complex curves and patterns. In most cases such procedures require stopping frequently unless the operator has practiced these tasks many times.

Different types of stitching are done using different types of sewing machines. In an apparel manufacturing setting, the type of stitching chosen for a particular task depends on various factors including the following:

- design and style of the garment
- use or function of the garment
- care of the garment
- type and weight of fabric selected
- placement of the stitching
- availability of sewing machine(s) and attachments
- method of construction
- method of production
- quantity of garments produced

Machine sewing stitches are grouped into eight classes based on FS751a. Each class is identified by the first digit of a three digit number, 100 through 800. These standard stitch classes are as follows:

- 100 - chain stitch
- 200 - hand stitch
- 300 - lock stitch
- 400 - multi-thread chain stitch (double-locked stitch)
- 500 - overedge stitch
- 600 - flat seam stitch
- 700 - single thread lock stitch
- 800 - simulated hand stitch

Industrial sewing machines are used in manufacturing plants where textile products such as apparel are produced. Usually, each type of industrial machine is designed to produce one particular type of stitch. With adjustments, some machines may produce more than one type of stitch. Conventional sewing machines are designed to produce a variety of stitches for use in a wide range of construction techniques.

Sewing machines have stitch regulators that can be adjusted so the machine sews a selected number of stitches per inch. Depending on the type and weight of fabric used, number of plies sewn, type of thread used, and type of sewing machine, different results may occur. The stitch regulator is used as a starting point. However, stitching samples should be done for each project to ensure that the correct stitch size is selected.

Guiding, Aligning, and Repositioning Work

Part of sewing involves guiding the work so that stitching falls within the standard margins. Some industrial machines have trimming attachments. When using these trimming attachments, it is important to not trim away too much material. Stopping during the sewing operation may be necessary for a variety of reasons. The most frequent reason is to realign work. It may be necessary to make several stops if controlling several layers of fabric. Complex curves and patterns may require stopping to keep stitching within acceptable margins. Replacing an empty bobbin or securing supplies such as tape, braid, or binding also requires stopping. Occasional thread breaks result in stopping to rethread the machine.

Sometimes a sewing machine operator must perform several stitching operations on one part of a sewing project. Stops may be necessary to add other pieces to the work being sewn. Tabs, labels, loops, gussets, reinforcing tapes, cords, or strips that cannot be inserted while sewing is in progress also require stops. Edges that must be folded by hand and gathers that must be pinched just before the work passes under the presser foot are also example reasons an operator may have to stop.

Releasing Work

Work must be released (separated from the sewing machine) at the end of each sewing procedure. The most efficient way for sewing machine operators to release work is to sew it out in a continuous chain. This process involves having several pieces of work ready to sew at one time. As one item is completed, another piece is immediately fed through the needle area so that the items are temporarily connected by a chain of stitching.

After several items are stitched, the items are disconnected by cutting the chains of stitching.

A second way to release work is to stitch to the edge of the work, pull it to the rear of the machine, and break the sewing threads by hand. When the operation does not include stitching to the edge, the work may simply be released when necessary by stopping, raising the needle and presser foot, pulling the threads to convenient lengths, and trimming the threads by hand with scissors, shears, or snips.

Frequently, the operator is instructed to sew a reinforcing stitch or a backstitch at the end of the seam before releasing the work. The operator may be required to hand trim the finished work to straighten irregular or frayed edges and to clip loose threads. However, in some manufacturing plants, sewing machine operators do not perform tasks such as trimming and clipping. In some situations, these tasks are performed by another employee in order to speed the sewing process.

Essential Questions: The Sewing Process

1. What is good machine control? Why is it important?
2. How is the type of stitching chosen for a particular garment or a specific sewing task?
3. What are different ways of releasing work at the end of each sewing procedure?

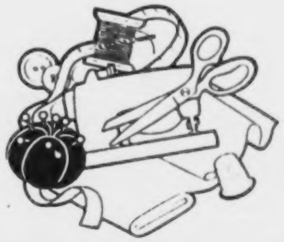
BASIC SEWING TECHNIQUES

Learning basic sewing skills prepares people for actual sewing operations. Sewing machine operators must learn to position work, follow straight and curved lines, turn corners, start and finish seams, and back tack or backstitch before beginning an actual sewing operation.

The mark of professional sewing is a perfect seam. A perfect seam is one that is not puckered, stretched, or crooked and is finished without tangled threads. This smooth appearance is the result of careful machine control. If the stitching does not meet the standard of the employer, the operator should rip it out and restitch it. Correcting mistakes contributes to professionally finished garments.

Good machine stitching has the following characteristics:

- Stitching is smooth with no tangles, loops, or puckers.
- Seams begin and end at exactly the appropriate points.
- Stitching follows the stitching line smoothly and accurately.
- The stitch length and tension are appropriate for the fabric texture and weight.
- The stitches are all the same size.
- There are no skipped or broken spots in stitching.
- The stitching does not cause the fabric to be off-grain due to stretching.
- The upper and lower threads are locked between layers of fabric.
- Repaired seams appear as one line of stitching.



Although there are certain widths of seams that are commonly used, seam widths sometimes vary. There are many types of ***seam guides*** to help sew seams the desired widths. Some sewing machines have metal guides that may be fastened securely at appropriate distances from the needle. Some machines have lines etched into the throat plate at several widths. Commonly used seam widths can also be marked on the machine with several strips of colored cloth tape.

It is important to watch the stitching width when sewing curves and when edgestitching. More information is presented later in this chapter on stitching curves. ***Edgestitching*** is performed close to an edge and may be done either on the right or wrong side of the fabric. For even stitching, the fabric is guided by lining up the edge of the fabric with some point on the sewing machine or the edge of the presser foot.

Backstitching

Backstitching, or ***back tacking***, involves sewing back and forth over the same row of stitching or sewing several stitches in one spot. It may be performed at either the beginning or end of a seam or at both ends. Backstitching is not used on every seam. It is used when no other stitching is placed over the ends of a seam to keep it from raveling. It is also used when sewn parts will be handled many times before another row of stitching is sewn over the end of a seam. Backstitching cannot be done on a chain stitch machine.

Staystitching

Staystitching is used to prevent seam lines from stretching out of shape while a garment is being constructed. Staystitching is done by sewing at regular machine stitch lengths in specified directions just inside the seam lines of individual garment pieces. Staystitching is performed after the garment pieces are cut out and before they are basted or sewn together. It is most important to staystitch along curved and angled seam lines, such as at the neck, armhole, and shoulder. On loosely woven fabrics, all seam lines should be staystitched. Staystitching is performed with the grain of the fabric as much as possible. Figure 13.1 shows an example of how staystitching is done during the construction of a shirt or blouse.

Staystitching a Blouse or Shirt

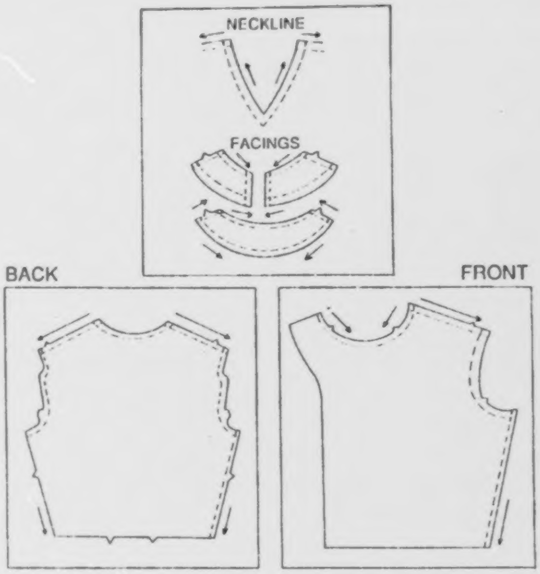


Figure 13.1

Basting

Basting is hand or machine stitching that temporarily holds two or more parts of a garment together. ***Machine basting*** is used for pleats, zippers, and hems or for holding facings and interfacing. Basting is usually removed after the seams are permanently sewn, but the basting can be left if it is not visible on the right side of the finished garment. A long, loose stitch on either lock stitch or chain stitch machines can be used for machine basting. The longest machine stitch is about 1/5 inch (the length of five stitches per inch). Hand-basting stitches can be any length but are often 1 inch long. Loose basting stitches are easier to remove than tight stitches.

Experienced sewers can increase the length of the machine-basting stitch by pulling the fabric out from behind the needle. However, care must be taken to prevent bending or breaking the needle or tearing the fabric. This method is used if the stitch must be longer than the machine can produce. The fabric may also be pulled if the machine makes small stitches as a result of the thickness of the fabric. The presser foot is raised slightly to allow the work to be pulled past the feed teeth.

Understitching

Understitching is a line of stitching applied near a seam line to make facings and seam allowances lie flat. It is often used around neckline facing seams when constructing garments. Seam allowances are trimmed, notched, or clipped after the seam is stitched. In addition, seam allowances are graded before understitching is done. ***Grading*** involves trimming the plies of the seam allowances of one seam to different widths in order to reduce thickness and eliminate bulk from the seam allowance. Figure 13.2 illustrates the procedures to follow in order to understitch.

Understitching Procedures

1. Grade both seam allowances.
2. Open out facing.
3. Press seam allowance toward facing.
4. Place garment on machine right side up.
5. Place facing and seam allowances away from outer garment fabric.
6. Check that seam allowances are smooth under facing.
7. Stitch close to seamline through facing and seam allowances.

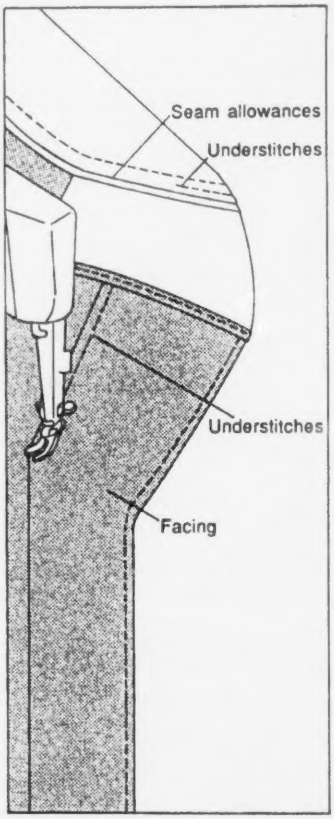


Figure 13.2

Topstitching

Any row of stitching visible on the outside of a garment is ***topstitching***. It may also be called ***finish stitching*** or ***surface stitching***. Topstitching requires speed, accuracy, and neatness. In some apparel manufacturing situations, operators learn to judge spacing for topstitching by sight alone. Topstitching is performed by stitching longer-than-average stitches on the right side of the garment with sewing thread, doubled sewing thread, or heavy thread.

Sewing Corners, Points, and Inserts

A ***corner*** is an angle of ninety degrees or more. Turning a corner involves making two connected rows of straight stitching in different directions. The process of turning a corner while stitching is called ***pivoting***. To pivot, the following steps should be used:

- Sew to the corner, stopping exactly at the corner.
- Leave the needle in the fabric if using a lock stitch machine.
- Leave the needle at its highest point if using a chain stitch machine.
- Raise the presser foot.
- Swing the fabric around the corner.
- Finish stitching the seam.

A ***point*** is an angle of less than ninety degrees. Sewing points accurately requires skill. In some cases, a sharp point may be sewn by making three or four curved stitches. This usually involves making several pivots. The fabric is turned slightly at each stop and a single stitch is made as the handwheel is turned with the right hand. The seam is then completed.

Inserts include items such as labels, loops, and tabs that are sewn on the top, bottom, or between plies of fabric. Inserts are usually placed near the hand used to pick them up. This process prevents unnecessary hand movement. The machine is stopped at the point where the insert is to be placed. The insert is then placed on the seam and stitching is done. Sometimes, the insert is backstitched. Some inserts, such as garment hangers, have two ends to be stitched. Each end is inserted individually.

Darts

Darts are used to shape a flat piece of fabric to fit the curves of a human body. Notches, chalk marks, or thread markers are used to indicate where to stitch. These markings are followed exactly to ensure the proper shape and fit of the finished garment. The two basic types of darts are single-pointed darts and double-pointed darts. Darts are used at places such as necklines, bust lines, elbows, and waistlines. Darts can be shaped as well as straight.

For a ***standard dart***, or ***single-pointed dart***, the dart is folded in half and pinned. Marks such as notches are matched. In some cases, darts are basted before permanent stitching is done. A straight seam is sewn from the notch to the dart point's marker. Figure 13.3 shows the steps for sewing a standard dart.

A ***double-pointed dart***, or ***contour dart***, is made by folding the garment piece along the fold line with right sides of the fabric together. Both sides of the dart are pinned by matching the stitching lines and the dart is basted. The pins are removed and the dart is stitched. The dart is stitched by beginning at the middle and stitching to one point. The garment piece is turned over and the other half of the dart is stitched. Stitching is overlapped at the wide part in the middle of the dart. Figure 13.4 illustrates the steps for stitching a double-pointed dart.

Some darts must be clipped, slashed, or trimmed before they are pressed. If a commercial pattern is used, information on the

Single-Pointed or Standard Dart

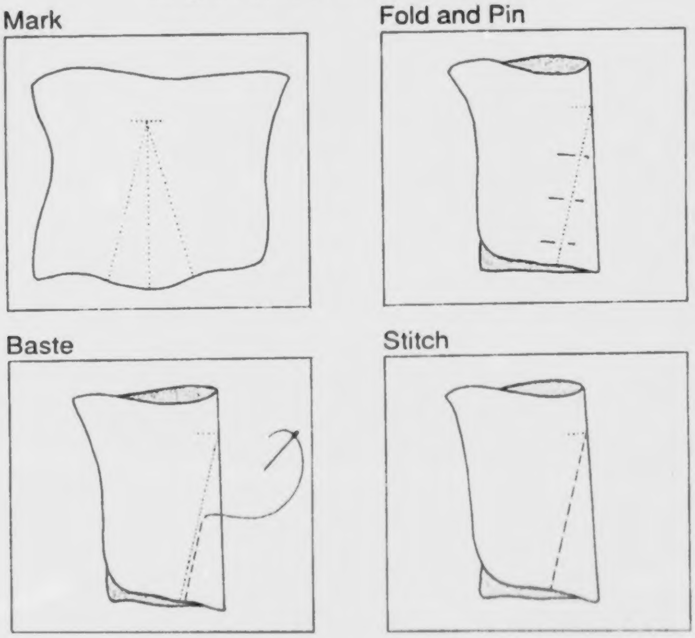


Figure 13.3

Double-Pointed or Contour Dart

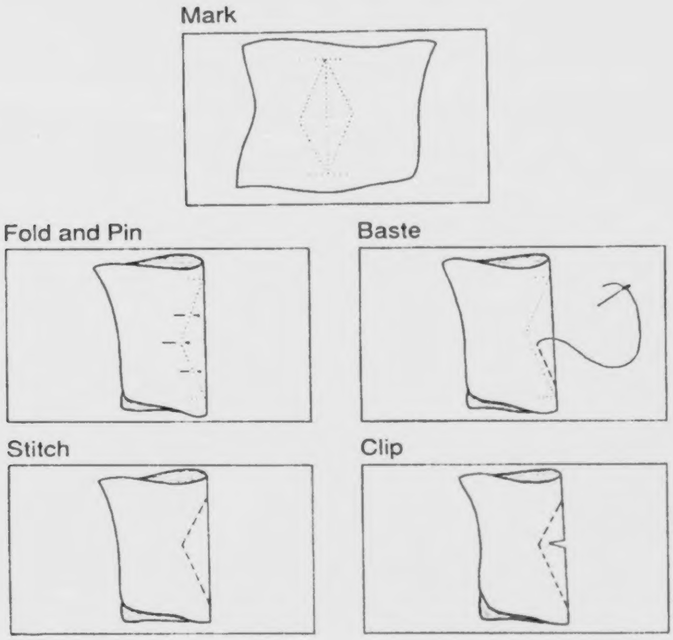


Figure 13.4

pattern guide sheet is helpful to decide which technique is necessary. In an apparel manufacturing setting, specifications are provided for each garment so that sewing machine operators know what techniques to use.

Pleats and Tucks

Pleats are folds in fabric. ***Tucks*** are stitched fabric folds. Pleats and tucks are used to add design interest and to control fabric fullness in a garment. The three common types of pleats are knife or side pleats, box pleats, and inverted pleats. Illustrations of these three types of pleats are shown in figure 13.5.

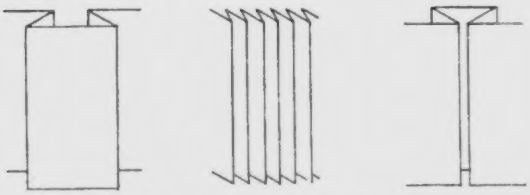

Box pleat
Side or knife pleats
Inverted pleat

Figure 13.5

Pleats that are to be open on the finished garment may be sewn with a basting stitch during construction that is later removed. Pleats can also be formed by stitching across the top edge of the fabric after it has been folded, using the notches as a guide. This stitching holds the pleats until they are sewn into another seam. The last section of this chapter provides information on pressing techniques used when constructing pleats.

Tucks are usually not as deep as pleats. The width and spacing of tucks can be varied for different design effects. To construct tucks, stitching lines are matched, pinned, and stitched. Tucks are first pressed flat and then to one side.

Buttonholes

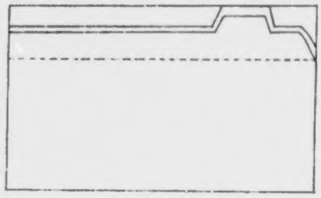
Buttonholes are made either by machine or by hand. The hand method is described in a later section of this chapter titled "Hand Stitches." The machine-made buttonhole is made with the zigzag stitch on zigzag machines or with a buttonhole attachment on straight stitch machines. The buttonhole is made of two straight sides of zigzagged satin stitch with bar tacks at the ends. After the buttonhole is made, the buttonhole's center is cut with an attachment on the machine, buttonhole scissors, or a buttonhole cutter.

◆ Essential Questions: ◆
Basic Sewing
Techniques

1. What are five characteristics of good machine stitching?
2. How is staystitching used in apparel construction? What is the difference between staystitching and understitching?
3. What is the purpose of darts? Define the two basic types of darts.
4. What is the difference between pleats and tucks? Why are they used?

BASIC SEAMS AND SEAM FINISHES

As defined earlier, a seam is a row or rows of stitching that hold(s) two or more layers of fabric together. There are various types of seams. A few basic seam types are presented in this chapter. A ***straight seam*** is formed when the fabric edges and the seam line are perfectly straight. When a straight seam is completed, plies should come out the same length with edges even, seams should be sewn the required width, and seams should not pucker.



To sew a straight seam, the following procedures may be used:

- Position at least two plies of fabric with one on top of the other and the edges even.
- Place the needle at its highest position to begin stitching. Pull the top and bottom threads under the presser foot toward the back of the sewing machine.
- Raise the presser foot high enough to position the work even with the needle hole. Align the edge of the work with the seam guide being used.
- Lower the presser foot while holding the fabric with the right hand.
- Grasp the edge of the fabric nearest the seam to be sewn with the index finger on top and the thumb on the bottom. Spread out the other three fingers and let them touch the machine bed.
- Pull the thumb back as the hands and the fabric move toward the needle, leaving just the index finger to hold the fabric tightly. Continue sewing until the finger touches the end of the presser foot.
- Move the hand in a straight line between the body and the sewing machine needle.
- Start the machine slowly, feeding fabric evenly so that it remains tightly stretched.
- Stop the sewing machine and reposition the hands when necessary. It may be necessary to reposition the hands several times during one sewing procedure if the seam is very long.
- Slow down as the end of the seam to prevent sewing off the fabric and damaging the sewing machine. Attempt to stop the machine not more than one or two stitches beyond the end of the seam.
- Stop sewing with the needle and the take-up lever in their highest positions.
- Raise the presser foot slightly and release the fabric.
- Pull the work away in the appropriate direction and break or clip the threads. Sometimes sewing machine operators are instructed to leave the threads attached to the next piece of work.

When sewing a curved seam, an imaginary curve should be followed as the fabric is fed into the machine. All stitches should be the same distance from the edge around the curve. Curves are stitched like straight seams, but require more control of the fabric.

Other types of basic seams include gathered seams and eased seams. A ***gathered seam*** is formed when the edge of a long fabric piece is gathered up to match the second edge of a shorter piece of fabric and sewn together. An ***eased seam*** is formed to join the edges of two plies of fabric that are slightly different lengths without forming gathers. The extra length is eased so that puckers and gathers are not created. Additional information on gathered and eased seams is included in Chapter Eighteen.

Seam finishes are techniques used to make seam allowances look neater and prevent the edges from raveling. They extend the life of a garment and add a professional appearance. Various seam finishes can be used. A few basic seam finishes are described in this chapter. The seam finish selected for a garment depends on the type and weight of the fabric, the wear the garment will receive, and whether or not seams will be seen. Plain, straight seams are finished after they have been pressed open. Plain, curved or cornered seams are finished, clipped or notched, and pressed open.

Every seam should be pressed before it is crossed with a second line of stitching. Depending on the type of seam and location of the seam, other techniques may be required also. Seams may be trimmed, graded, notched, or clipped. Figure 13.6 illustrates basic procedures for trimming, grading, clipping, and notching various types of seams.

Trimming involves cutting away a part of the seam allowance to reduce bulk. As previously discussed, grading is a method of trimming a seam with two or more thicknesses of fabric in a seam allowance. Each seam allowance is trimmed to a different width to reduce bulk. ***Clipping*** involves cutting a seam allowance on an inside curve so that the seam will lie flat when the garment is turned right side out. The points of the scissors or shears are used to cut into the seam allowance at right angles. ***Notching*** is a method of cutting out V-shaped pieces from a seam allowance on an outside curve so that the seam will lie flat when the garment is turned right side out.

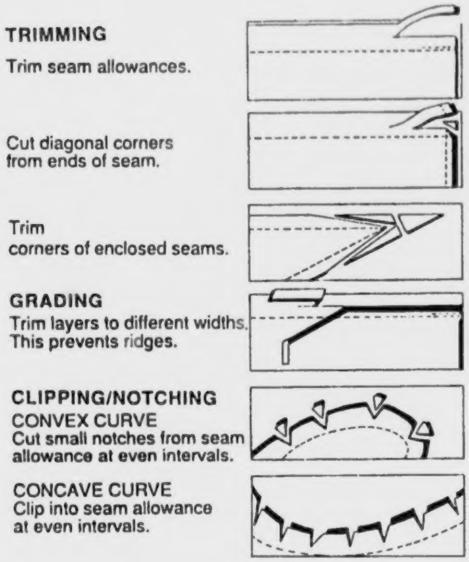
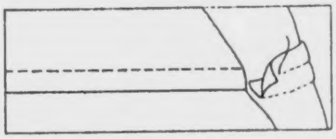

TRIMMING
Trim seam allowances.
Cut diagonal corners from ends of seam.
Trim corners of enclosed seams.
GRADING
Trim layers to different widths. This prevents ridges.
CLIPPING/NOTCHING
CONVEX CURVE
Cut small notches from seam allowance at even intervals.
CONCAVE CURVE
Clip into seam allowance at even intervals.

Figure 13.6

Welt Seam



To make a ***welt seam***, a plain seam is stitched and pressed toward the side to be topstitched. One seam allowance is trimmed to 1/4 inch. The wider seam allowance is pressed over the trimmed edge of the other seam allowance. The seam is topstitched 1/4 to 1/2 inch from the seam line on the right side of the fabric.

French Seam

The French seam is used on fine quality garments to prevent raw seams or raveled edges and to strengthen seams. It is especially used for visible seams, such as those on sheer fabrics and in unlined jackets. The ***French seam*** is a self-enclosed seam that is stitched on both sides of the fabric. The first seam is made with the wrong sides of the fabric garment pieces placed together. The seam allowances are trimmed. The seam is then folded the other direction with right sides facing and is stitched again. Figure 13.7 illustrates procedures to follow in constructing a French seam.

Trimming of seam allowances is usually performed with a trimming attachment in manufactured garments. Seam allowances are trimmed by shears or a trimming attachment when sewing with conventional machines. Trimming ensures an even seam width to cover and enclose seam allowances. The finishing seam must be wide enough to cover the cut edges of the previous seam, but it should be as narrow as possible to avoid bulk. This type of seam is usually used on straight seams; the French seam is difficult to sew if the seams are curved.

Another type of seam, the ***mock French seam***, can substitute for the French seam on curved seams. The mock French seam is made by sewing a plain seam first. The seam allowances are trimmed to 1/2 inch. Each seam edge is turned in 1/4 inch and pressed. Folded edges are stitched together and pressed to one side.

French Seam

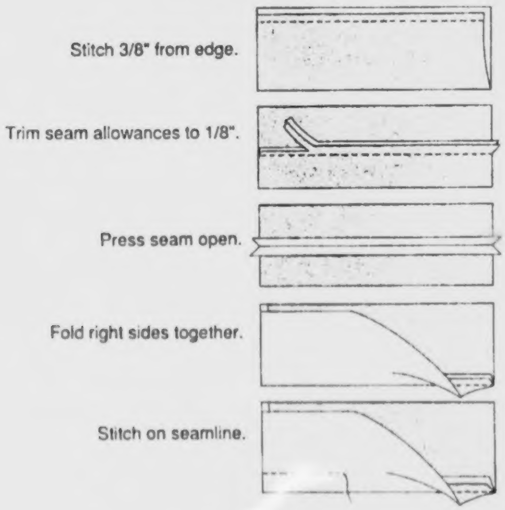


Figure 13.7

Flat-Felled Seam

The ***flat-felled seam*** is a durable seam that is used for garments that receive much wear and repeated washings. It is a very sturdy seam and is used commonly on jeans and other clothing such as tailored shirts, pajamas, work clothes, sportswear, and children's clothing. The raw edges of the seam allowances are enclosed in the process of making the flat-felled seam. This seam is appropriate for use on straight edges and very shallow curves. Figure 13.8 illustrates the steps involved in producing a flat-felled seam.

Flat-Felled Seam

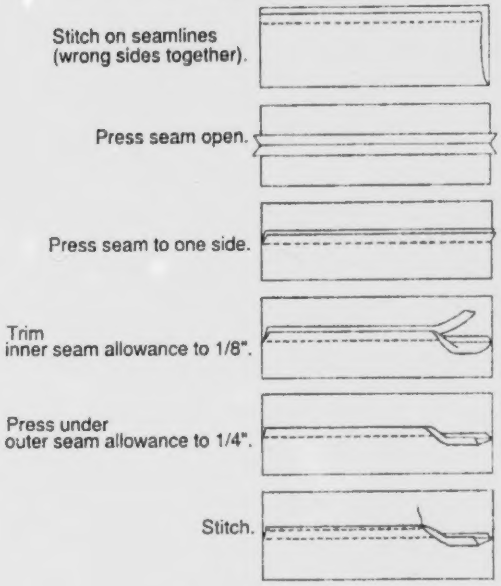
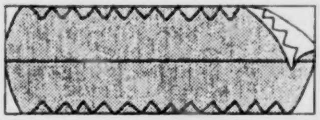


Figure 13.8

Double-Stitched Seam

Producing a double-stitched seam involves sewing and finishing the seam in two steps. To produce a ***double-stitched seam***, a plain seam is stitched first. The seam is trimmed to 1/4 inch. The seam is completed with a row of straight stitches 1/8 inch from the first row of stitching. Sometimes, if the double-stitched seam is used on lightweight woolens or knits, zigzag stitching is used instead of straight stitching.

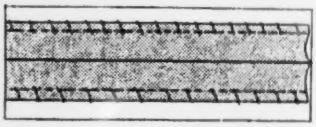
Zigzag Seam Finish



A ***zigzag seam finish*** is a series of alternately angled stitches applied to the raw edges of a seam allowance. The fabric is positioned so that one side of the angled stitches will form over the edge of the fabric. If the stitches do not form over the edge of the fabric, the fabric is trimmed to the edge of the stitching.

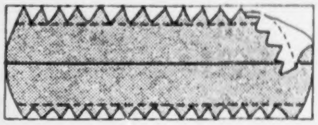
Hand-Overcast Seam Finish

To produce a ***hand-overcast seam finish***, a single thread is used to make slanted stitches at the edge of each seam allowance. Stitches should be slightly more than 1/8 inch deep and 1/4 inch apart. The thread should not be pulled too tightly. The hand-overcast seam finish is used when use of a machine finish is not practical.



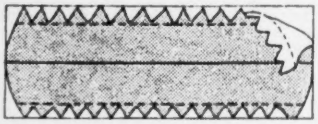
Pinked Seam Finish

A pinked seam finish is made by trimming the seam allowances with pinking shears before pressing the seam. The seam allowances are trimmed close to the raw fabric edge. The pinked seam finish is used when working with fabric that will not ravel easily.



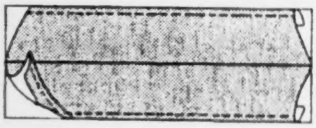
Pinked and Stitched Seam Finish

To produce a ***pinked and stitched seam finish***, a line of short stitches is machine stitched 1/4 inch from the seam allowance edge. The edge of the seam allowance is trimmed with pinking shears.



Clean Finished Seam

To produce a ***clean finished seam***, the edge of the seam allowance is turned under 1/8 inch (or 1/4 inch if fabric ravels easily). The edges of the seam allowance are pressed. The edge of the fold is machine stitched. A straight line of machine stitching at the 1/8 inch or 1/4 inch fold line makes it easier to fold the fabric edges under.



◆ Essential Questions: ◆
Basic Seams and Seam Finishes

1. What are the purposes of seam finishes?
2. In what situations are seams trimmed? graded? notched? clipped?
3. What are the differences in French seams, welt seams, flat-felled seams, and double-stitched seams?

HAND STITCHES

Few garments can be completed without any hand stitching. Hand stitches are often used in alteration and repair of garments. ***Hand stitches*** involve a variety of stitches made with a hand needle including basting, a fast temporary stitch, and a wide range of permanent stitches. Permanent hand stitches are used for hemming, tacking, sewing on fasteners, overcasting, and handworking buttonholes.

The following steps may be used to perform hand stitches:

- Chose the right size needle for the type of fabric and thread.
- Use a single 18 to 24 inch length of thread, coated with beeswax for added strength and slipping ease.
- Cut the thread at a slant and never break, bite, or tear it.
- Thread the cut end through the needle and knot it.
- Wear a thimble on the second finger of the sewing hand.

- Keep stitches fairly loose to avoid a puckered or tight look.
- Fasten the thread in the fabric by taking a few small backstitches or by making a knot at the end of the thread and hiding it on the wrong side of the fabric.
- Use either backstitching or knotting to end stitching.

Each hand stitch serves a definite purpose. Stitches that hold the garment together must be lasting, such as the backstitch. The hem of a skirt or sleeve is held in place with hemming stitches or slipstitches. Lightweight fabric can be sewn quickly with a running stitch. The running stitch can also be used for hand shirring. Overcasting stitches keep edges of fabric from raveling.

Use the following guidelines to make hand sewing faster and easier:

- Lay most of the work down or place the work toward the body holding only the edge in the hands. This process makes the work easier to handle, increases stitching speed, prevents crushing the fabric, and eliminates cramped hands.
- Work from right to left if right-handed (with the exception of the catchstitch). Work from left to right if left-handed.
- Turn the narrow edges of the work across the forefinger of the hand holding the work.
- Slant the needle toward the shoulder opposite the sewing hand for most stitches. Pointing the needle toward the body is less awkward and tiring than pointing it away from the body.
- Begin and end sewing on a part of the garment not seen from the outside of the garment such as a seam allowance.
- Avoid pulling the thread too tightly. Leaving stitches loose prevents puckering and breaking of the threads during wear and laundering.

Holding Hand Work

Work may be held for hand sewing using several methods. One method is to keep the work flat on the table for hand sewing pleats, folds, lapped seams, long seams, and hems that slip or stretch easily. Basting marking lines, catch-stitching, and basting underlinings or interfacings are also easier to do with the work flat on the table. The index finger of one hand is used to push up a small amount of fabric directly in front of the needle. Then, the needle is pushed through the fabric with the sewing hand, making one stitch at a time. All the thread is pulled through after several stitches have been made. To keep the work from slipping, the other fingers and the thumb of the holding hand are used. Figure 13.9 illustrates this process.

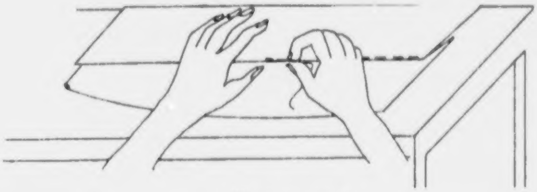


Figure 13.9

Another method of holding handwork is up off the table in both hands for making running stitches, gathering by hand, and easing in fullness. Working from side to side, small stitches are made with the sewing hand. The fabric is held between the thumb and forefinger of each hand. The needle is woven up and down through the fabric. The holding hand is used to move the fabric up and down at the point of the needle. When the needle has several small stitches on it, the needle is pulled through the fabric. The needle is left in place for the next stitch. Figure 13.10 illustrates this process.

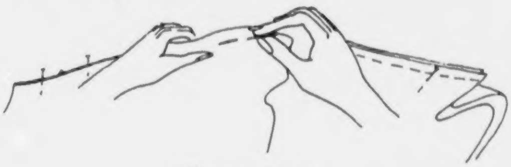


Figure 13.10

Handwork may also be held up and down across the forefinger of the holding hand for hemming, slip-basting, and many of the decorative stitches. This method is illustrated in figure 13.11.

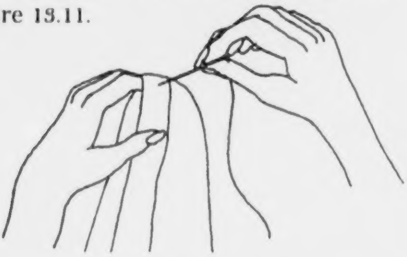


Figure 13.11

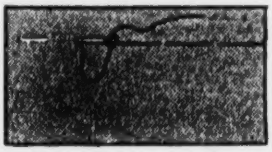
Another way of holding work is from side to side for overcasting. The work is pinched firmly between the thumb and forefinger of the holding hand.

Backstitch

The ***backstitch*** is used to secure hand stitching at the beginning and end of a seam, to repair seams, and for topstitching, hand stitching zippers, and hand understitching. It is the strongest of the hand-sewn stitches. To secure stitching at the beginning or end of hand stitched seams, the needle and thread are positioned under the layers of fabric. The needle is inserted through all fabric layers about a stitch-length behind the last stitch. The needle and thread are pulled through the layers of fabric close behind the spot where the thread emerged from the last stitch. The shorter the backstitch, the more secure the stitch is. For an even more secure backstitch at seam ends, a loop of thread is left while making the backstitch by not pulling the stitch tautly. Another small backstitch is made on top of the first and the needle and thread are pulled through the loop. Stitches are pulled tautly and the thread is cut.

Basting Stitch

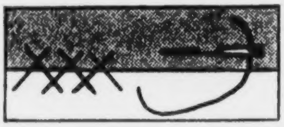
As previously discussed, the basting stitch is used to temporarily hold fabric layers together during fitting and construction until the layers can be permanently sewn.



Even basting stitches are the same length on both sides of the fabric layers and is used where more control is needed than can be achieved with uneven basting. ***Uneven basting stitches*** appear longer on one side and shorter on the other side of the fabric layers. It is used for general basting and marking. For even basting, the work is performed from left to right. Several evenly spaced stitches are placed on the needle before the needle and thread are pulled through the fabric layers. For uneven basting, the stitches are usually about 1/4 inch long and spaced 1 inch apart.

Catchstitch

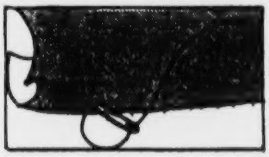
The ***catchstitch*** is mainly used as a hemming stitch. The two types of catchstitches are the flat catchstitch and the blind catchsitich. The flat catchstitch is primarily used when hemming medium-weight to heavyweight knitted or woven fabric. The flat catchstitch is also used to hold facings to garment fabric and to attach interfacing to fabric.



The blind catchstitch or inside catchstitch is stitched in the same manner as the flat catchstitch but it is done between the hem and the garment fabric. The blind catchstitch is commonly used to hem knitted fabrics.

Slipstitch

The ***slipstitch*** is used for hemming, tacking facings, attaching patch pockets, finishing waistbands, attaching trims, and

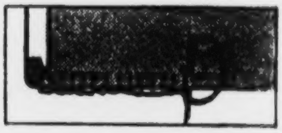


attaching jacket linings. The stitches should be invisible on the right side of the garment. Sometimes the slipstitch is done between the hem and the garment. This stitch is called the blind slipstitch and should be invisible on both the hem edge and the outside of the garment.

To hem using a slipstitch, the thread is fastened and the needle is brought up through the folded hem edge. A stitch is made in the garment fabric, opposite the point at which the thread came out, picking up just one or two fabric threads. The needle is inserted through the folded hem edge and slipped through the fold about 1/4 inch. Stitching is done loosely.

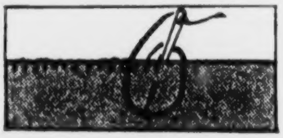
Blanket Stitch

The ***blanket stitch*** is used to decorate garments, patch garments, and make hand-stitched bar tacks. The blanket stitch is worked from left to right. The needle and the fabric's edge are pointed toward the body. The thread is fastened to the fabric and brought below the edge of the fabric. For each stitch, the needle enters the fabric from the right side and is brought to the fabric's edge. With the thread underneath the needle's point, the needle is pulled through the fabric to form the stitch.



Buttonhole Stitch

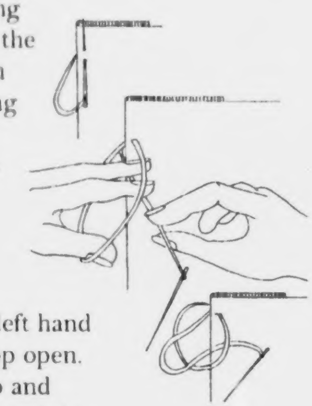
The ***buttonhole stitch*** is used as a decorative finish, to make hand-made buttonholes, and to attach snaps, hooks, and eyes. The fabric is placed away from the body and the needle is pointed toward the body. Stitching begins with the thread at the cut or outside edge of the fabric. The needle is inserted from the outside to the inside of the stitch. The needle is inserted from the back side to the front side of the fabric to form a vertical stitch. The thread is wrapped under the eye end of the needle first; then, the thread is wrapped under the pointed end of the needle. The thread is pulled completely through the fabric and left loose.



Thread Chain

Thread chains are used as belt carriers and loops for buttons. The chain can be fastened to the garment in a loop or made to lie flat against the garment. To make a thread chain, the following steps may be used:

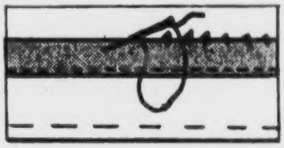
- Mark where the chain should begin and where it should be fastened onto the garment.
- Make a small stitch at the beginning mark and pull the thread through partially, leaving a large loop about 4 inches long.
- Use the thumb and first two fingers of the left hand to hold the loop open. Use the thumb and forefinger of the right hand to hold the thread supply.
- Reach through the loop with the second finger of the left hand, grasp the thread in the right hand, and pull the thread through the loop to start a new loop. As the new loop is being formed, the first loop should slide off the fingers and tighten as it is drawn near the fabric.
- Hold the new loop as the first loop was previously held with the thumb and two fingers.
- Continue making the thread chain using this process until the desired length is achieved.



- To finish the chain, slip the needle through the last loop and tighten the loop into a knot.
- Sew the chain to the fastening point on the garment.

Vertical Hemming Stitch

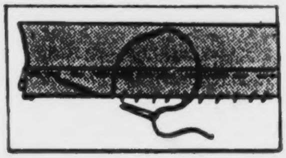
Hemming stitches are used to secure hems to garments. The flat, ***vertical hemming*** stitch has small floats passing over the hem's edge to the garment. It is suitable for hems finished with seam tape. The thread is fastened between the garment and hem (near the top of the hem), and the needle and thread are pulled through the hem's edge. One thread of the garment fabric is caught to begin each stitch. The needle is directed downward diagonally to pierce the hem's edge about 1/4 inch to the left. Then, the needle and thread are pulled through the fabric.



Blind-Hemming Stitch

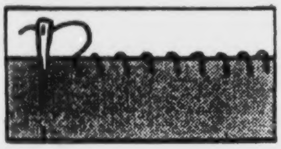
Blind-hemming stitches are made between the hem and garment fabric, resulting in hem stitches that are invisible. To make the blind-hemming stitch, the following steps may be used:

- Pull down a small portion of the hem edge and work the needle from right to left with the needle pointing to the left.
- Take a small stitch 1/4 inch to the left in the garment fabric, picking up only one or two threads from the fabric.
- Take the next small stitch 1/4 inch to the left in the hem.
- Continue the process, alternating the stitching in the garment fabric and hem.



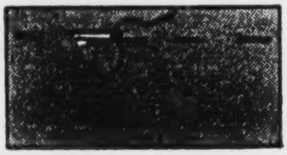
Overcast Stitch

As discussed in the previous section of this chapter, the ***overcast stitch*** finishes the raw edges of seams or fabric to prevent raveling. Diagonal stitches are made over the edge of the seam or fabric an even distance apart and at an equal depth.



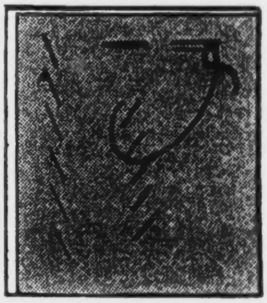
Running Stitch

Running stitches are used for seaming, tucking, mending, gathering, and other delicate sewing work. Running stitches are the same as basting stitches, except that running stitches are smaller and permanent. To make running stitches, a long, fine needle is woven in and out of fabric, taking several 1/8 inch stitches at a time.



Padding Stitch

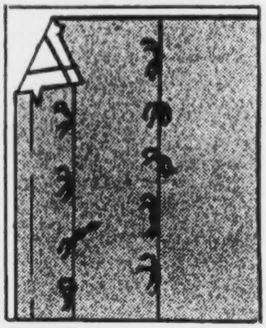
Padding stitches are used in tailoring to attach interfacings to outer fabric, and to form, control, and shape garment sections such as the collar and lapel. ***Padding stitches*** are permanent stitches that look like temporary diagonal basting stitches. Longer stitches are used for holding interfacing and garment fabric together. Short stitches are used to mold, form, control, and shape garment sections. Since padding stitches are permanent, they should not show on the garment's outer fabric.



French Tacks

French tacks hold two garment sections together, such as a coat and its lining, while keeping both sections loose. To make French tacks, a small stitch is placed at the top of the garment's hem edge. A small stitch is placed at a directly corresponding point on the other garment section, leaving 1 to 2 inches of thread slack between the two stitches. This process is repeated about two more times. Closely spaced blanket stitches are then worked over the threads.

Tailor's Tacks



Tailor's tacks are used to transfer pattern markings and construction details onto fabric garment pieces. Tailor's tacks require more time than other transfer methods but are necessary in some situations. An easy tailor's tack method for single layers is to make loose uneven basting stitches along the details and markings on the pattern with a double, unknotted thread. After the stitching is completed, the stitches are clipped in half. The fabric and the pattern are gently separated without tearing the pattern or pulling out the tailor's tacks.

For tailor's tacks on double layers of fabric, the pattern is slit at the pattern symbols to be marked. Using double, unknotted thread, a stitch is made through the pattern and fabric layers at each pattern symbol or marking. The thread is pulled through and a 1 inch thread end is left. A 1 to 2 inch loop is made by taking another stitch in the same place. Once the loop is made, the thread is cut 1 inch from the stitches. After all symbols are marked with tailor's tacks, the pattern is gently lifted from the fabric and thread markings. The fabric layers are separated and the thread loops are snipped between the layers.

◆ **Essential Questions: Hand Stitches** ◆

1. What are three methods of holding work for hand sewing tasks?
2. What are five different types of hand stitches? How are each of these stitches made?

GARMENT REPAIR TECHNIQUES

When customers purchase clothing or have garments cleaned, they expect them to be in good condition. Customers are disappointed if garments have loose or missing fasteners, ripped seams, or other repair needs. Cleaners and retail stores have alteration and mending specialists who identify and repair clothing problems. Some businesses also specialize in mending and altering clothing.

Buttons

Loose buttons should be resewn with a strong thread. A ***shank*** made of thread allows the buttonhole to lay flat under the button without strain. When a shank is made, two crisscrossed pins, a darning needle, a match stick, or a round toothpick is/are laid across the top of the button before sewing it to the garment. When enough stitches have been made to securely hold the button, the object used to help form the shank is removed. The button is pulled away from the fabric and thread is wrapped around the thread under the button to reinforce and to form the shank. The thread is fastened underneath the button on the garment's wrong side to finish the task. When a button is sewn on a coat, the needle and thread are woven around and in between the strands of thread under the button to form a sturdy shank with little bulk.

For buttons in locations that receive much strain (such as a heavy coat or a front-buttoned dress), cotton twill tape may be used as a reinforcement. The bottom three or four buttons are removed. A strip of 1/2 or 5/8 inch twill tape is stitched on the underneath side, down the center of the button line. The buttons are reattached to the garment.

If buttons or fasteners have been pulled away from the garment leaving a torn place or hole, a piece of muslin, cheesecloth, or the fabric itself is used under the tear for reinforcement. The hole or tear is mended on the sewing machine or by hand with small, closely-spaced, back-and-forth stitches until the entire surface is smooth and even. Fusible mending tape may also be used. The button is securely attached over the reinforced section.

Buttonholes

To repair worn buttonholes, the worn stitches are removed. Care should be taken to avoid stretching the buttonhole. After steam pressing the spot, the buttonhole is reworked with a strand of matching thread using a buttonhole stitch or blanket stitch. To repair a completely raveled buttonhole, machine stitching is used close to the cut edges of the hole. Then, the buttonhole is reworked by hand.

A torn buttonhole in lightweight fabric is mended by ripping out the old buttonhole stitching and placing a patch between the top and the facing of both sides of the buttonhole. The patch is extended beyond the full length of the buttonhole and tear. The tear is mended on the sewing machine by making tiny stitches back and forth over the worn places and through the patch until the entire opening is covered. A new buttonhole is made over the patched area with the sewing machine.

If threads of a handmade buttonhole break and ravel or if the buttonhole is stretched, the stitches should be removed. To repair the buttonhole, the edges of the buttonhole are steam pressed together. Hand stitches are made around the buttonhole close to the edges. If a buttonhole is machine stitched, a piece of sheer, lightweight fabric (such as organdy, voile, or batiste) should be placed underneath for reinforcement before the buttonhole is stitched around the opening. The buttonhole is then reworked by machine.

Snaps, Hooks, and Eyes

When snaps, hooks, and eyes are replaced or resewn, they are sewn onto the garment neatly and securely using a sturdy stitch such as the buttonhole stitch. A strong, but not heavy, thread is used. To reinforce hammer-on or no-sew snaps, a row of machine stitching is placed on each side of the metal parts.

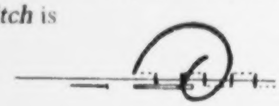
Seam Reinforcement and Repair of Rips

Employees in alteration/repair businesses or departments, laundries, and dry cleaners are often asked to repair rips and reinforce seams in garments. New garments with rips or skips in stitching are sometimes accidentally shipped to retail stores. Rips can also occur when customers try on garments.

Repairing ripped seams is a common mending task. In a retail store, several customers may try on a garment before it is purchased; therefore, seam repairs are often necessary. Repairs should be performed professionally and carefully. The garment should never appear worn or patched.

Repairs can be made either by hand or machine. When it is possible to reach the seam, it is best to use the sewing machine to repair. In some situations it is hard to get to the seam. Therefore, it is necessary to repair the seam with hand stitches. The thread used to make a repair should match the fabric as closely as possible. Thread a shade darker than the fabric blends well. Nylon, silk, or strong mercerized thread may be used for machine repairs. As discussed in Chapter Six, mercerization is a chemical bath applied to cotton or cotton-covered polyester thread to make it have greater strength, more luster, and a smoother surface.

In addition to the hand stitches described earlier, the ***lock stitch*** is often used to repair rips and seams. The lock stitch is an invisible stitch that is as strong as short machine stitches.



Because machine stitching breaks more easily in curved and bias seams, seam reinforcement may be required in these areas. Seam breakage occurs in other areas that receive strain. The following suggestions may be used for reinforcing seams and areas of strain in a garment:

- Machine stitch curved and bias seams using short stitches. Stitch again about 1/16 inch beyond the seam line.
- Use small machine stitches to restitch pocket corners that are beginning to rip due to strain.
- Use straight (twill) or bias tape to reinforce seams. Sew the tape to the inside of the seam, if possible. Use tape to reinforce armseye seams, necklines, plackets, and vents.
- Use bar tacks at the end of plackets to reduce the possibility of rips caused by strain.
- Restitch frayed seams and make them slightly wider if the fit of the garment is not affected. Finish the edges of the seams to prevent further raveling. Check with the customer before widening seams or doing anything to change the fit of the garment. If a garment fits the body closely, small changes in the seam lines will affect its fit.

Darning

Darning is a method of repairing a hole or tear by following the grain line and by anchoring new yarns in the fabric on all sides of the hole or rip. The process of darning involves covering broken yarns and replacing missing yarns. The process is only used to repair small holes in fabric. The repaired area looks much like the weave of the fabric. Darning may be performed on the sewing machine or by hand.

The following suggestions are helpful when making hand or machine darns that are hardly visible:

- Study the weave of the original fabric and make the darn look as much like the original weave as possible.
- Perform the work under the best light available.
- Use a fine needle and short thread. A long thread pulled back and forth across a torn place or worn hole can pull and stretch the damaged area out of shape. Sometimes, fabric yarns can be removed from seam allowances for use in darning.
- Perform darning on the right side of the fabric and blend it into the fabric around the hole.
- Attempt to make a flat darn. If yarns are pulled too tightly, the finished darn looks puckered. Stitching that is too loose gives the darn a puffy look.
- Attempt to weave the mending yarn or thread between fabric yarns, not in and out of the fabric.
- Make small stitches. Avoid pulling the thread too tightly when making a turn. Run stitches unevenly into the cloth around the darn in order to prevent a hard, heavy line around the darn.

- Pull the ends of darning yarns to the underside of the garment and cut them off, but not too closely. Work the darn so that all raw edges of the hole or tear are on the wrong side of the fabric.
- Steam press the finished darn from the wrong side. If fabric is wool or is napped, brush the darn to lift the nap.

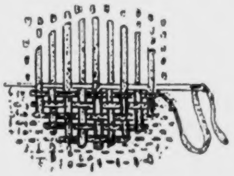
A machine darn is a quick way to repair straight, three-corner, or jagged tears or diagonal cuts. A machine darn should be used if the darn will not show, if a mended hole can be covered by replaced buttons, or for reinforcing worn areas in work clothes. When darning on the sewing machine, the sewing machine feed should not be used. On some machines the feed can be lowered below the throat plate. On other machines, the throat plate is raised above the feed. The pressure should be released on the presser foot. The stitch length should be adjusted to a length that is appropriate for the fabric being repaired. Short stitches are best for cotton fabric. Fairly long stitches are best for knits since these fabrics are soft and flexible. A regular presser foot may be used or a special darning and embroidery foot may be used for more control. Fabric may be placed in a darner or embroidery hoop during the darning process to keep it tight.

The following steps may be used to produce a neat machine darn:

- Place the damaged spot right side up over an ironing board, sleeve board, or other flat surface. Straighten or trim any tangled or frayed yarns.
- Cut a piece of underlay fabric (reinforcing fabric) from lightweight, fusible interfacing fabric. Make the underlay no larger than necessary to reinforce and hold the cut or torn area in place.
- Slip fusible interfacing fabric under the damaged area, adhesive side up. Hold the reinforcing fabric in place with pins. With yarns combed exactly in place, cover the mend with a thin cloth to protect fabric. Press the fabric. If necessary, press again from the inside.
- Use either silk or fine, cotton thread that matches the fabric's luster and is a slightly darker shade than the fabric. If a fusible interfacing is not used, baste a thin piece of fabric underneath the damaged spot. Outline the opening 1/8 or 1/4 inch from the edge, depending on the texture of the fabric. Machine or hand stitch back and forth over the damage, usually with the grain of the fabric. To prevent a ridge, run the stitches into the fabric so that the rows are not all the same length.
- Trim away any extra reinforcing fabric, unless it is needed to strengthen the area surrounding the damage.
- Tack reinforcing fabric invisibly to the back of the fabric with padding stitches.
- If damage is a three-corner tear, snag, or badly-frayed spot, machine stitch both crosswise and lengthwise.

The following guidelines are helpful for making a plain hand darn:

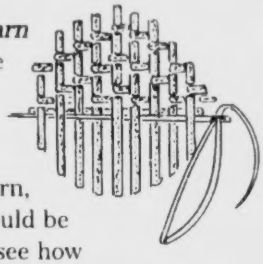
- Snip away ragged edges of holes.
- Steam press the area to be darned, pointing the iron toward the center of the hole.
- Choose darning yarn or thread that matches the fabric closely in color, weight, and luster. Use a fine needle, but do not knot the thread. Using nylon or silk thread makes the darn stronger and more serviceable. Using beeswax will also strengthen the thread. Hand darning works best on heavy wools and flannels.



- Use small running stitches beginning about 1/4 inch from the edge of the hole. Work back and forth, lengthwise, across the hole and far enough into the fabric to strengthen the thin or worn area that may surround the hole. A darn is less noticeable if stitches can be run into the underside of a woven area surrounding the hole. This is possible only if there is no thin or worn area surrounding the hole.

- Weave crosswise, over, and under the lengthwise yarns and into the surrounding fabric. Keep lines of stitching and thread over the opening parallel, evenly spaced, and even in length. Avoid pulling the threads too tightly since this will cause the darned area to pucker.

A pattern darn is used to repair small holes in suiting or dress fabrics with distinct weaves. A ***pattern darn*** is done to match the special weave of a fabric being repaired. Before making a pattern darn, the fabric weave should be studied carefully to see how lengthwise and crosswise yarns are interwoven. Using a magnifying glass is helpful. The fabric weave should be reproduced as closely as possible in the darn, using matching thread or yarn.



Patching

If the hole in a garment is very large, it is often better to patch than to darn. ***Patching*** involves covering a hole or a tear with matching or contrasting fabric or fitting a piece of matching fabric into a hole. Patching is a repair method used primarily in home sewing. Since it is not commonly used in industry settings, general information is provided in this chapter on patching procedures.

To patch, the area around the hole is pressed with the point of the iron directed toward the hole. The lengthwise threads of the fabric are pressed first; then, the crosswise threads are pressed. The damaged area should be cut into a square, rectangle, or oval, following the grain of the fabric. The patch selected should be appropriate for the task. Types of patches include hemmed, inset, straddle, lapped, knit stitch, and blanket stitch.

The following suggestions may be used to make patches that are not noticeable:

- When a damaged garment is a bit shrunken and faded, patch it with similarly shrunken and faded material to help hide the mend.
- If new fabric must be used to patch a washed and shrunken garment, shrink the patch; otherwise, the finished patch may not lie flat after laundering.
- On a ready-made garment, patch material can usually be taken from a facing, hem, pocket, sash, or from underneath the collar or cuffs. If patching fabric cannot be obtained from such areas, match the fabric as closely as possible in color, texture, and weight.
- If the fabric has a design, slide the patch material beneath the hole until the pattern matches. In a fabric with an up-and-down pile or nap such as corduroy, match the direction of the pile or nap. Careful matching helps hide a patch.
- When cutting patches, cut with the grain of the fabric making sure that lengthwise and crosswise yarns match those in the fabric being repaired.

Ready-cut patches are available in several fabrics including denim, broadcloth, corduroy, and soft knits. These patches are cut to a specified size and can be used to repair holes or worn spots in garments. They can be applied by hand or machine sewing. In choosing the type of patch to use, the fabric construction, texture, and color should be considered. Woven fabric patches are usually more appropriate for use in repairing items such as jeans and sport coats. Some decorative patches are made in special shapes and in contrasting colors or textures. These patches are sometimes called appliqués. An ***appliqué*** can serve as both a trim and a patch. Appliqués should complement the fabric weight, color, and texture used to construct the garment.

Repairing and Reinserting Zippers

The ***zipper*** is a widely used fastening device for women's, men's, and children's garments. Heavy wear, improper care, and frequent laundering or dry cleaning can damage a zipper or affect the way it functions. Employees in alteration departments of dry cleaners and retail stores often repair and replace damaged zippers.

When altering the waistline or side seam in a garment, it is often necessary to remove a zipper and reinsert it. If this process is necessary, the construction method used by the manufacturer should be observed carefully before removing the zipper. The same method used by the manufacturer should be used to reinsert the zipper in the garment.

The three types of zippers are conventional or regulation, separating, and invisible. Various sizes, weights, and colors of zippers are available. The ***conventional zipper***, or ***regulation zipper***, is closed at one or both ends. It is concealed under garment seam folds or placed in a slashed opening. The ***separating zipper*** is open at both ends allowing the zipper to disconnect completely. It can be concealed beneath seam folds or used as a decorative zipper so that it shows on the right side of the garment. The ***invisible zipper*** is a self-concealing zipper, closed at one end, and applied to the seam line with no visible means of stitching.

Each type of zipper is applied by hand stitching or with a special zipper foot that is attached to the sewing machine. A ***coil-constructed zipper*** is a continuous strand (monofilament coil) of nylon or polyester twisted into a spiral and attached to a tape made of manufactured fibers. Coil-constructed zippers have a self-healing feature that allows them, when jammed by entangled threads, fabric, or other material, to be repaired. The repair is done by folding the zipper lengthwise, grasping it between thumb and forefinger, and twisting sharply. The zipper coils disengage and allow the material to be removed. When the slider is moved to the bottom of the zipper and up to the top, the zipper becomes functional.

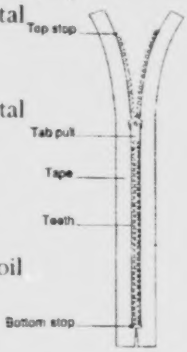
Coil

The ***chain-constructed zipper*** is made of individual teeth called metal scoops that are constructed of aluminum or brass. The metal scoops are attached to a tape made of cotton or cotton blended with another fiber. Zippers made of monofilament coils are more flexible and lighter in weight than chain-constructed zippers.

Metal scoop

Measurements used in directions for inserting zippers refer to the length of the teeth or coil, not the length of the zipper tape. Several terms related to zippers are defined below.

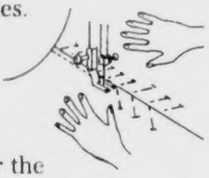
- ***tape*** - the zipper fabric
- ***teeth*** - metal or plastic parts attached to the zipper tape on a chain-constructed zipper
- ***coil*** - a continuous strand of polyester or nylon used in place of metal teeth for a more flexible and lightweight zipper
- ***tab pull*** or ***slider*** - the metal tab that glides over the teeth or coil to open and close the zipper
- ***bottom stop*** - metal bar placed over the teeth or coil at the bottom of the zipper to stop the slider
- ***top stop*** - metal bar placed on one side of the tape at the top of the zipper teeth or coil to stop the slider
- ***overlap*** - the fold of garment fabric extending over the zipper chain
- ***underlap*** - the opposite side of the overlap on a garment to which the other side of the zipper is stitched
- ***placket*** - a partial opening in a garment in an area such as the neckline, waistline, or sleeve



Before replacing a broken zipper or making alterations in the zipper area, the stitching that holds the zipper should be removed. The waistband or neckline facing is opened far enough to remove the zipper. If the seam edge is frayed, a strip of cloth or tape is added. The zipper is backstitched or machine stitched on the side of the opening that will lap over to cover the zipper on the outside of the garment.

The commercial method for reinserting a zipper in either the side seam or center back of a garment is easy and provides a smooth line. For the commercial method, the following guidelines may be used:

- Stitch the seam the length of the zipper teeth or coil using a machine basting stitch.
- Press the seam open and remove the basting stitches.
- Close the zipper and place the fold of the front seam allowance over the zipper teeth or coil making sure to cover the teeth or coil.



- Pin the zipper in place, starting at the top and working to the bottom of the zipper. Place pins diagonally about 1 inch apart with the points toward the seam line.
- Pin the back fold of the garment directly against the zipper teeth or coil at the bottom of the zipper.
- Use a zipper foot, a special sewing machine attachment, to stitch the zipper. Open the zipper about 1 inch and begin stitching 1/2 inch from the fold on the garment. Remove the pins as the presser foot reaches them to prevent puckers in the stitching line.
- After stitching about 1 inch from the top of the zipper, stop the machine. Leaving the needle in the fabric, raise the presser foot and push the tab pull to the top stop of the zipper.
- Continue sewing with a straight line of stitching.
- Stitch to the bottom of the zipper, pivot, and stitch across the bottom of the zipper.
- Pivot at the edge of the fold and continue stitching to the top of the zipper. Stitch as closely as possible to the fold. The presser foot will glide on top of the closed zipper teeth while this line of stitching is being made.
- Open the zipper when the needle is about 1 1/2 inch from the top to allow a straight line of stitching past the tab pull. It may be necessary to lift the needle to provide space for sliding the tab pull. If this is done, reinsert the needle in the same place it originally was, and continue stitching to the top of the opening.

A ***fly front zipper insertion*** is one in which the zipper tape is double stitched to a facing that is then turned back and stitched a measured distance from the folded edge. A lap is produced that conceals the other half of the zipper, which is stitched to an underlay extending beyond the center front line. The fly front opening usually laps from right to left in women's pants and always laps from left to right in men's pants.

The following procedures may be used to reinsert and repair zippers in the fly front of pants, slacks, or jeans. Illustrations of these steps are included in figure 13.12. Following these steps will result in a fly front zipper application with a left to right lap. For a right to left lap, the sides should be reversed while following the same procedures.

- Do not remove stitches below the bottom of the placket when removing the old zipper from the fly front of trousers, slacks, or jeans. Do not remove the crosswise stitching at the bottom of the placket. This stitching keeps the bottom of the placket strong. Remove stitches from the left side of the placket to loosen the facing.
- Place the closed zipper between the fold and the shield with the pants turned to the outside. Make sure that the bottom of the zipper is even with the bottom of the opening. (See step A of figure 13.12.)
- Pin the extra zipper tape that extends past the top edge in place. Hand backstitch or machine stitch along the old stitching line

Fly Front Zipper Insertion

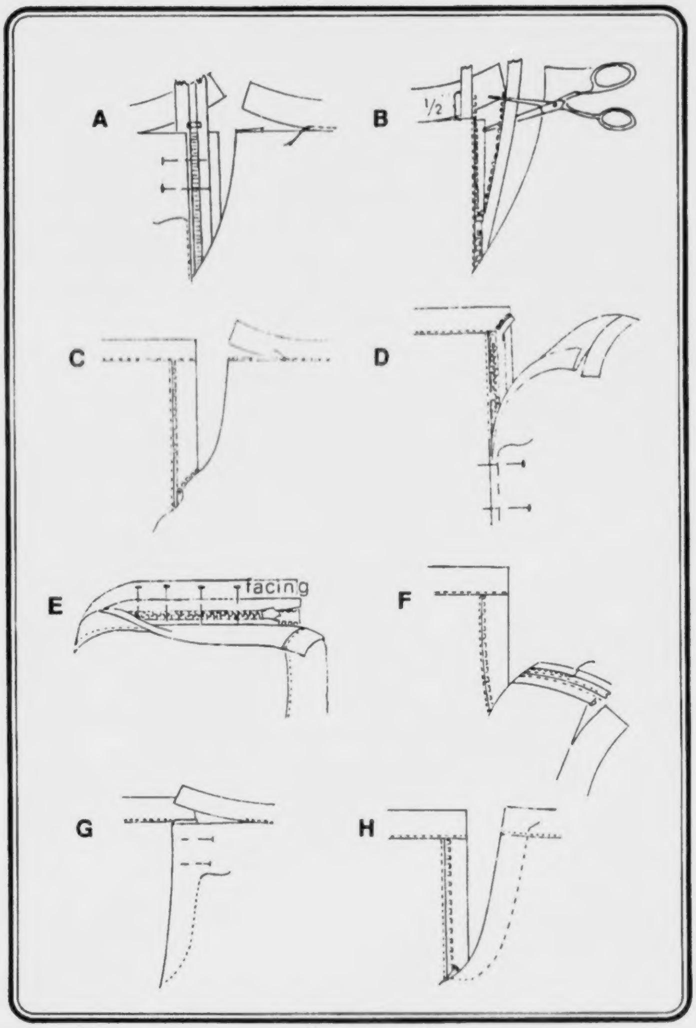


Figure 13.12

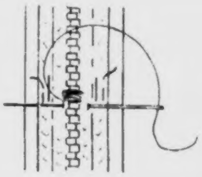
by starting at the bottom of the zipper. (See step A of figure 9.13.)

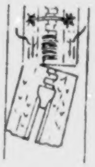
- Open the zipper and mark both sides of the zipper 1/2 inch above the waistline seam. Cut off the zipper at the marks. (See step B.)
- Sew the waistband back in place where the zipper was stitched, following the old line of stitching. (See step C.)
- Close the zipper and place the top side of the fly placket over the zipper. Pin and baste the zipper down so the fly will lie flat. (See step D.)
- Open the facing to the inside of the pants and pin the loose edge of the zipper tape to the facing only. (See step E.)
- Turn the pants to the outside and remove the basting that holds down the fly.
- Open the zipper and hand backstitch or machine stitch the zipper tape to the facing with two rows of stitching (1/4 inch apart). (See step F.)
- Pin the facing in place and hand backstitch or machine stitch along the original stitching line, starting at the bottom. (See step G.)
- Sew the waistband back in place. (See step H.)

To save time, a regular presser foot is sometimes used to reinsert zippers instead of stopping to attach a zipper foot. Some alterations departments or businesses keep bottom stops for zippers that can be applied quickly with pliers. A bottom stop can be used to shorten a zipper without affecting the top stop. Zipper repair kits are available from supply companies. These kits include items such as metal bottom stops, tab pulls, zipper teeth, and special tools to attach zipper parts.

Zippers are available in almost any length. Sometimes a zipper length that is not available is required for a particular garment style. Zippers can be shortened from the bottom or the top. Separating zippers are usually shortened from the top. The following procedures are sometimes used to shorten zippers from the bottom:

- Choose a method of application and baste the zipper to the garment.
- Whip stitch across the zipper coil several times 1/4 inch below the desired end of the zipper opening.
- Sew a large, straight metal eye for a new bottom stop above the whip stitches.
- Cut off the extra zipper tape and teeth below the whip stitches and 1/2 inch below the new bottom stop.
- Complete the zipper application.





The following procedures should be followed when shortening a zipper from the top:

- Baste the zipper to the garment to within 1 inch of the desired end of the zipper teeth (at the top of the zipper).
- Open the zipper and remove the extra teeth from the zipper tape.
- Use two straight metal eyes for new top stops. Bend the metal eyes in half around each side of the zipper tape above the teeth.
- Sew the new top stop to the tape.
- Close the zipper. Fold the top ends of the zipper tape down before completing the zipper application. Trim off the extra zipper tape. Tack the tape ends down.
- Complete the zipper application.

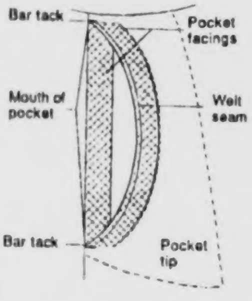
After inserting a zipper, the placket area is pressed from the inside, using a press cloth. On the outside, a press cloth is used and brown paper is placed between the placket lap and the garment.

Repairing and Replacing Seam Pockets

Seam pockets, especially those in men's pants, often wear out before the rest of the garment. A seam pocket is a pocket sewn into the side seam or the side front seam of a garment. Seam pockets are used in skirts, slacks or pants, shorts, and dresses. The type of repair required is determined by observing how worn the pockets are. If only the bottom of the pocket is worn, only part of the pocket should be replaced. This procedures is sometimes referred to as replacing a half pocket. However, if the entire pocket is worn, a new pocket must be inserted in the garment.

The following terms are related to pocket replacement procedures:

- ***pocket tip*** - the bottom part of the pocket
- ***pocket bag*** - two pieces of fabric sewn together to form the inside of a seam pocket
- ***mouth of pocket*** - the opening of the pocket
- ***pocket facings*** - the facings that are located at the mouth of the pocket and are made from the same fabric as the garment
- ***welt seam of pocket*** - a strengthening stitch at the top of the mouth of the pocket; sometimes called lapped seam or topstitched seam
- ***bar tack*** - stitching at the top and bottom of the pocket's mouth that reinforces the opening



The following steps may be used to replace a half pocket in a garment. Illustrations of these steps are included in figure 13.13.

- Cut off the lower half of the pocket.
- Rip the seam out in the part of the pocket that has been removed. Using this part of the pocket as a pattern, cut a new pocket half, allowing at least 1 to 1 1/2 inches of extra fabric across the top for a seam. (See step A of figure 13.13.)
- Attach the new half pocket to the top half of the original pocket using a flat-felled seam. Make a French seam at the bottom of the pocket for reinforcement. (See step B.)

Attaching a Half Pocket

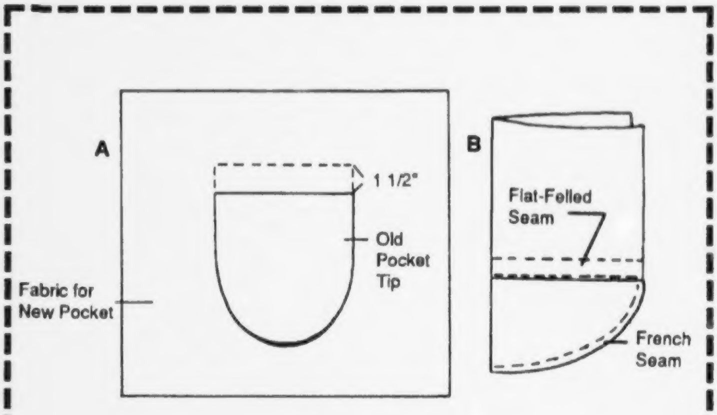


Figure 13.13

There are various ways to replace an entire seam pocket in a garment. As with any other repair method, it is important to follow the procedures used by the alteration department or business for which one is employed. The following steps describe one method for replacement of a seam pocket. Illustrations of the procedures are included in figure 13.14.

- Look carefully at the construction of the pocket before ripping any part of the pocket. Remove any belt loops. Remove stitches that attach the waistband facing to the waistline far enough to reach the pocket. (See step A of figure 13.14.)
- Remove stitches holding the side of the pocket in place. Rip out the seam on the pocket sides and bottom. (See step B.)
- Remove stitches that attach the pocket facing to the top side of the pocket. (See step C.) If bar tacks at the bottom and top of the pocket are sewn through the pocket, cut around them; do not remove them. When the stitches attaching the pocket facing to the pocket are removed, the pocket will open up as shown in step D of figure 13.14.
- Cut the pocket out of the garment, beginning 1/2 inch beyond the edge of the pocket facing. Cut flush with the bottom of the facing at the lower edge. (See step E.)
- Cut a new pocket using the old pocket as a pattern. Allow an additional 1 1/2 inches on the side of the pocket that was cut from the garment. (See step F.)
- With right sides together, stitch the side of the new pocket with the 1/2 inch allowance to the 1/2 inch extension of the old pocket. Use a 1/2 inch seam. This step results in a seam allowance on the outside of the pocket.
- Fold the pocket in half with the wrong sides together and stitch a 1/4 inch seam at the bottom of the pocket. This step results in the seam allowance being on the inside of the pocket. Turn the pocket inside out.
- Topstitch the facing to the pocket as it was originally on the right side of the garment. (See step G of figure 13.14.)
- On the wrong side of the garment, fold under the lengthwise edge of the top pocket side. Stitch the edge of the pocket to the side seam allowance. Make a French seam on the bottom of the pocket. (See step H.)
- Attach the top of the pocket to the waistband as it was originally.

Replacing a Seam Pocket

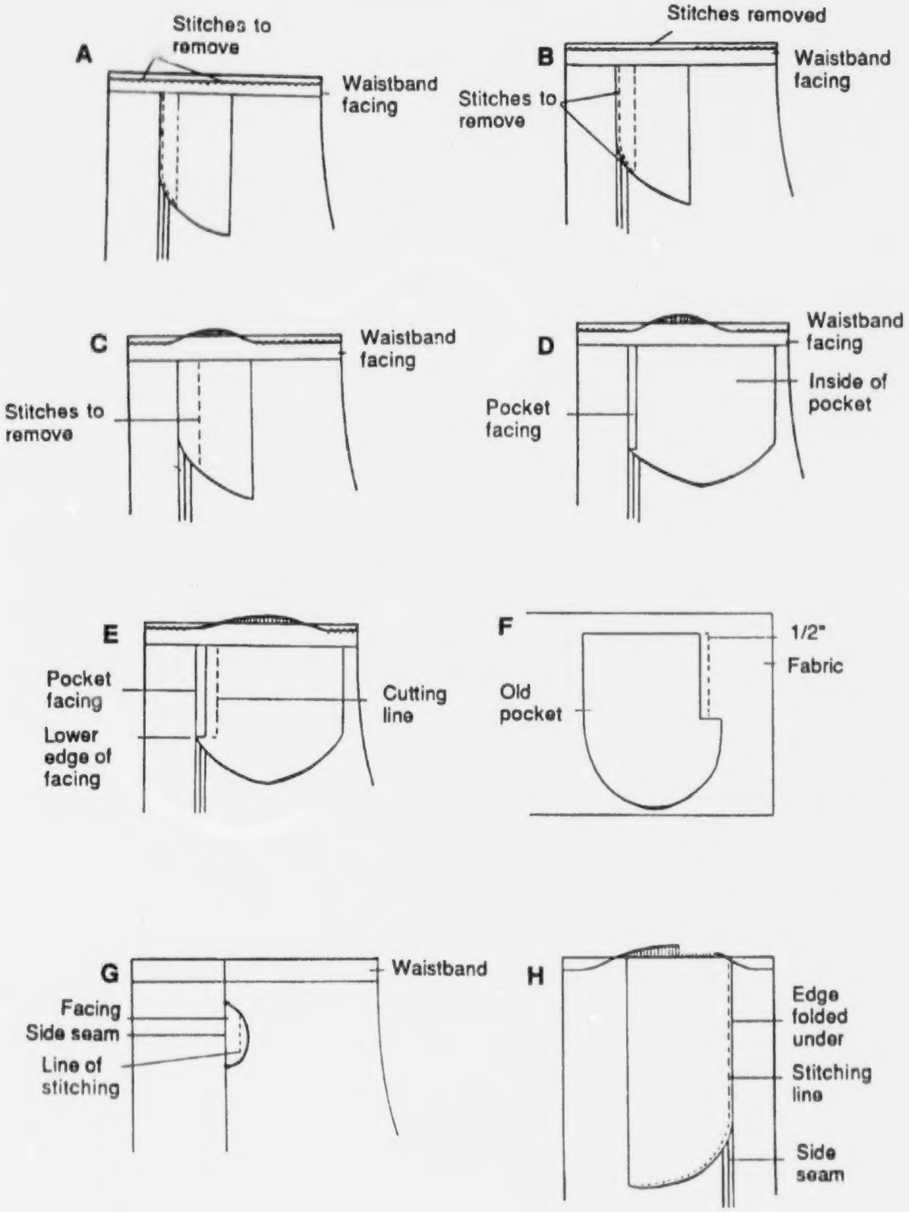


Figure 13.14

◆ Essential Questions: ◆
Garment Repair Techniques

1. What are common repairs that have to be made to customers' garments?
2. What are three suggestions for making hand or machine darns that are hardly visible?
3. When is it best to patch a garment rather than darn it?
4. What is the difference between a coil-constructed zipper and a chain-constructed zipper?
5. How can the type of repair required for a seam pocket determined?

Chapter Highlights

☆ Good work methods involve using the principles of motion economy in order to save time and be more efficient.

☆ Good machine control means the operator can start, stop, and sew at the speed desired. In addition, good machine control involves feeding materials through the machine evenly to accomplish assigned tasks.

☆ Skipped stitches and breaking thread are often caused by faulty sewing machine threading. It is important to follow correct threading procedures so that the machine operates properly.

☆ Different types of stitching are accomplished using different sewing machines. Choice of stitching depends on various factors including design and style of the garment, type and weight of the fabric selected, care of the garment, method of construction, and the quantity of garments produced.

(Continued on page 222)

Chapter Highlights

(Continued from page 221)

- Sewing machine operators must learn to position work, follow straight and curved lines, turn corners, start and finish seams, and back tack or backstitch before beginning an actual sewing operation.

- Basic sewing techniques include backstitching; staystitching; basting; understitching; topstitching, sewing corners, points, and inserts; feeding uneven plies; and sewing darts, pleats, tucks, and buttonholes.

- When a straight seam is completed, plies should come out the same length with edges even, seams should be sewn the required width, and seams should not pucker. Trimming, grading, clipping, and notching are used on various types of seams.

- Types of seams include the welt seam, French seam, flat-felled seam, and double-stitched seam.

- Seam finishes are techniques used to make seam allowances look neater and prevent edges from raveling. Seam finishes include the zigzag seam finish, hand-overcast seam finish, pinked seam finish, pinked and stitched seam finish, and clean finished seam.

- Hand stitches are made with a hand needle and include basting, the backstitch, catch stitch, slip stitch, blanket stitch, buttonhole stitch, thread chain, vertical hemming stitch, blind-hemming stitch, overcast stitch, running stitch, padding stitch, French tacks, and tailor's tacks.

- When customers purchase clothing or have garments cleaned, they expect them to be in good condition. Garment repair is done at many retail stores, alteration businesses, and dry cleaners.

- Garment repairs that are commonly done include repairs to buttons, buttonholes, snaps, hooks and eyes, rips, seams, zippers, and pockets. Repair procedures commonly used include darning, patching, and seam reinforcement.

Chapter 14

Use and Care of Sewing Equipment

Chapter Focus

The following Essential Knowledge and Skills are discussed in this chapter:

5A Describe types, uses, and care of equipment, tools, and supplies used in apparel production.

6D Describe types, use, and care of tools, equipment, and supplies used to alter, repair, and customize textile and apparel products.

Chapter Vocabulary

automatic stitch sewing machine
chain stitch sewing machine
computerized sewing machine
conventional sewing machine
electronic sewing machine
industrial sewing machine
lock stitch sewing machine
strait stitch sewing machine
zigzag sewing machine

Read chapter sections for additional terms related to sewing machines, attachments, and miscellaneous sewing equipment and tools.

The cost of an industrial sewing machine varies from several hundred to several thousand dollars. Therefore, the cost of all machines, other pieces of equipment, and tools in an apparel manufacturing plant or custom sewing business amounts to a sizeable investment. This chapter identifies and describes the tools and equipment used by apparel manufacturers, custom sewers, dressmakers, tailors, and alterationists. It also describes the uses, functions, and care of these tools and equipment. Taking care of tools and equipment and developing good working habits are as important as sewing skills.

Regardless of assigned tasks, it is important that textile and apparel industry employees keep their work areas relatively neat and orderly. Good work habits result in efficient use of time, assist with energy management, protect equipment and tools, and promote safety. It is also important for each employee to become mentally organized. Thinking ahead helps ensure that all supplies and equipment are ready when needed.

SEWING MACHINES

Sewing machines come in conventional and industrial models. Designers, custom sewers, and alterationists may use either type of machine to complete their work. Employees working in apparel manufacturing plants use industrial sewing machines.

Types of Conventional Sewing Machines

Conventional sewing machines are sewing machines designed for use by home sewers or people in the business of custom sewing, alterations, or designing. Conventional sewing machines come in the following four basic types: straight stitch, zigzag stitch, automatic stitch, and electronic or computerized.

A ***straight stitch sewing machine*** stitches in straight lines by feeding fabric forward and backward. Some straight stitch machines have attachments for making buttonholes or sewing a zigzag stitch.

A ***zigzag sewing machine*** makes both straight stitches and zigzag stitches without any special attachments. An ***automatic stitch sewing machine*** can make straight, stretch, chain, zigzag, and decorative stitches with built-in discs or pattern cams. A ***cam*** is a metal disc of irregular shape mounted on a rotating shaft as part of a sewing machine's internal mechanisms, and it is used to produce zigzag and decorative stitch patterns.

Electronic sewing machines, or ***computerized sewing machines***, can complete the same tasks as automatic stitch machines. However, they are equipped with programmable (computer) electronics. The operator may enter any stitch variations desired into the machine's programmable memory, and the machine automatically stitches the programmed stitch variations. Programmable sewing machines are sometimes capable of creating monograms and more than 100 decorative stitch patterns automatically.

Use of Conventional Sewing Machines

Every employee who operates a sewing machine should be familiar with the parts of the sewing machine and how they function. The sewing machine parts affect the stitches produced and therefore the final quality of the garments produced. Each domestic sewing machine is slightly different. However, all sewing machines have basic parts that can be identified although they may be found in slightly different locations on different machines. Figure 14.1 illustrates a basic conventional sewing machine. The head of the sewing machine is the main part of the machine, excluding the bed (the flat base of the machine that contains the bobbin and bobbin case).

Although sewing machines are very similar and produce about the same results, different models and brands are not exactly alike. It is important to be thoroughly familiar with the sewing machine that is used. Operators should know how to start stitching, control the machine speed, and stop smoothly at the appropriate locations. Machine speeds are controlled with foot controls or knee controls.

Forming Stitches. Stitches are formed by the sewing machine when upper thread (threaded through the needle) links with the lower thread (wound on a bobbin). A ***bobbin*** is a small metal or plastic cylinder that holds thread and is placed in the lower part of the sewing machine under the feed. The thread from the bobbin locks with the needle thread

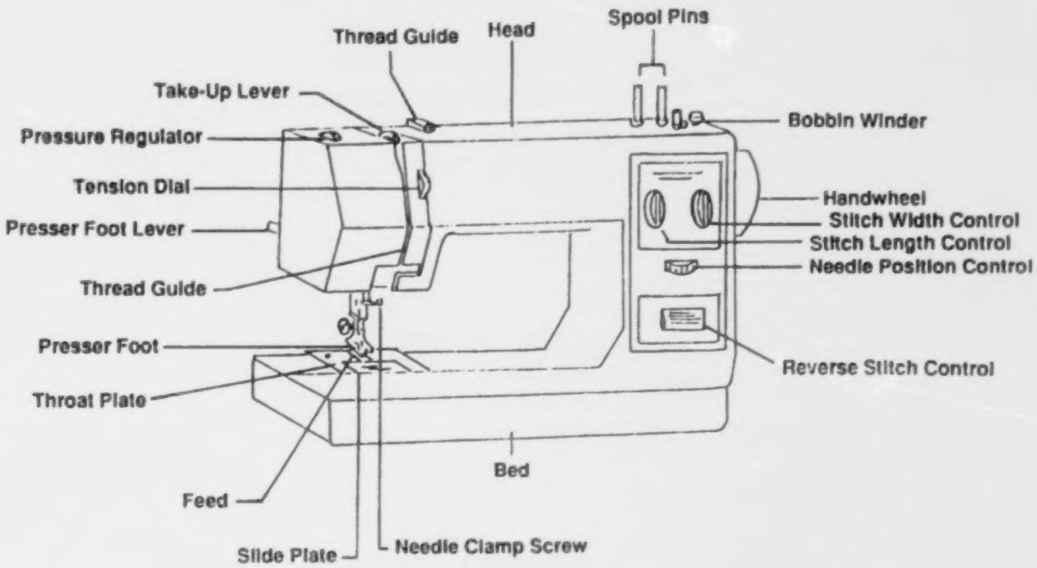
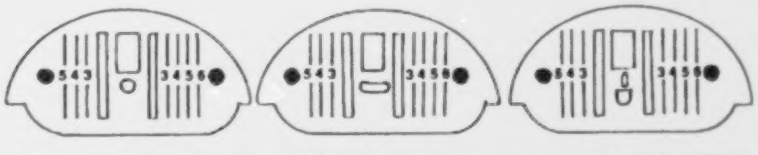


Figure 14.1

to make an interlocked stitch. This stitching process occurs as the following steps take place:

- The needle moves through the fabric taking the top thread into the bobbin area.
- The top thread forms a loop as the needle rises.
- The shuttle hook, a hook that rotates in the bobbin area, catches the thread loop.
- The shuttle hook carries the thread loop around and under the bobbin case.
- The thread loop slides off the shuttle hook as it rotates and links with the bobbin thread.
- The top and bottom threads are pulled up together and are set into the fabric as a lock stitch.

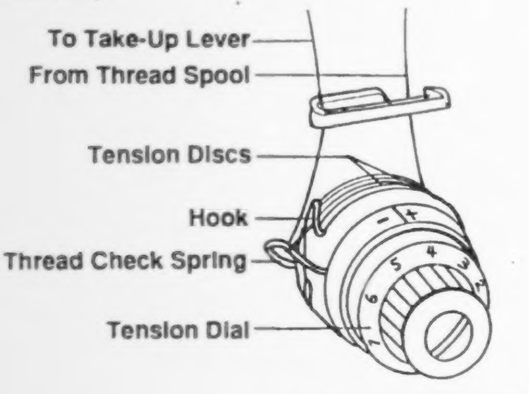
As the needle moves toward the bobbin area to form a stitch, it passes through an opening in the throat plate. The ***throat plate***, or ***needle plate***, is a removable metal plate attached to the base of the sewing machine directly under the needle bar. There are openings in the throat plate for the feed to move up and down as it pulls the fabric under the presser foot. On some machines, the throat plate has etched lines at several widths from the needle. These lines serve as seam guides so that stitching can be placed evenly at specific widths. A different type of throat plate is used for zigzag stitching than for straight stitching. The zigzag throat plate has a larger opening for the needle since the needle moves from left to right for zigzag stitching. In addition, there is a special throat plate used to chain stitch. Chain stitching is stitching made when the top thread forms a continuous row of stitches. Figure 14.2 illustrates three types of throat plates.



Straight Stitch Throat Plate **Zigzag Throat Plate** **Chain Stitch Throat Plate**

Figure 14.2

Adjusting Tension. To make a perfect stitch, the tension on the needle thread and the bobbin thread must be correctly balanced. Tension is controlled by thread guides and tension discs. ***Thread guides*** are small hooks attached to the sewing machine that hold and guide the thread as it moves from the thread spool to the needle. ***Tension discs*** are two discs that apply pressure to the thread to help control the thread's flow as stitches are formed. As the machine is threaded, the thread is placed between the two discs. The tension discs are often located behind a tension dial on the front of the sewing machine. The ***tension dial*** regulates the tension of the tension discs on the needle thread (top thread). The combination of tension discs, tension dial, special hooks, and spring are referred to as the ***tension assembly***. Parts of the tension assembly are illustrated in figure 14.3. The top thread tension should be adjusted when the presser foot is down since the tension discs are open when the presser foot is up.

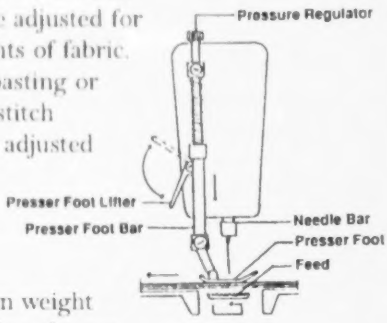


Tension Assembly

Figure 14.3

The top thread tension and bobbin tension should be balanced so that the linkage of the two threads occurs at the appropriate place. When the tension is properly balanced, the linkage of the top thread and the bottom thread should lie toward the center of the fabric layers. When the top tension is too tight, the linkage of the top thread and bottom thread will appear on the top layer of fabric. When the top tension is too loose, the linkage of the two threads will lie toward the bottom layer of fabric. The tension dial is used to adjust the top thread tension by increasing or decreasing the amount that the tension discs press against each other and against the top thread. If stitch tension problems cannot be corrected by adjustments to the tension dial, the bobbin thread tension may be adjusted. Bobbin thread tension is corrected by turning an adjustable tension screw found on the bobbin case. The bobbin case is a small compartment that holds the bobbin. Adjustments to the bobbin tension should be made by turning the adjustable tension screw very small amounts.

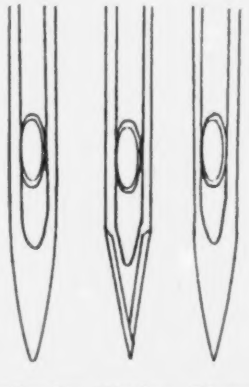
Adjusting Stitching. The ***stitch regulator***, or ***stitch length control***, determines the length and direction of the stitch. The ***feed*** is the part of the sewing machine under the needle that moves the fabric under the presser foot and advances the fabric one stitch at a time. The feed creates an upward force. The distance the feed moves the fabric for each stitch is changed by adjusting the stitch regulator. The stitch length must be adjusted for different weights of fabric. For machine basting or heavy fabrics, stitch length may be adjusted to six to eight stitches per inch. When sewing medium weight fabrics, stitch length may be set at ten to fourteen stitches per inch. The smallest stitch length, sixteen stitches per inch, is used for very sheer, delicate fabrics. The stitch regulator's numbering system is different for different types of sewing machines. It is important to check the manufacturer's instructions or make test samples to determine the number of stitches per inch produced by each setting.



When sewing different weights of fabric, it is also necessary to adjust the pressure of the presser foot on the fabric. ***Pressure*** refers to the downward force placed on the fabric by the presser foot. This pressure holds the fabric layers so that they move evenly together during stitching. This adjustment is made by adjusting the ***pressure regulator***. There are different types of pressure regulators including a dial on the side of the machine, a push bar on top of the machine, a dial on the top of the machine, and a screw type regulator. Stitch width may also be regulated. The stitch width control regulates the width of zigzag stitching and positions the needle for straight stitching. On most machines, the needle ***position control*** regulates the position of the needle from left to center to right.

As described in Chapter Thirteen, backstitching involves sewing back and forth over the same row of stitching or sewing several stitches in one spot. Backstitching is used to reinforce the ends of plain seams and in mending. Some machines have an automatic backstitch mechanism that allows the machine to automatically create a backstitch. Most machines have a button or lever, called a ***reverse stitch control*** that allows the operator to stitch backward.

Using Sewing Machine Needles. There are various types and sizes of sewing machine needles. Sewing machine needles are selected based on the type and weight of the fabric being sewn. Five basic types of sewing machine needles are sharp, ballpoint, wedge-shaped, twin, and triple. A ***sharp needle***, or ***general purpose needle***, has a sharp point and is used to sew woven fabrics. A ***ballpoint needle*** has a slightly rounded tip and is used when sewing knits and stretch fabrics. The rounded tip allows the needle to slip between fabric yarns. A ***wedge-shaped needle*** has a wedge-shaped point and is used to sew leathers and vinyls. A ***twin needle*** or ***double needle*** is used for decorative stitching. It consists of two needles attached at the point where they are inserted into the sewing machine. A ***triple needle*** is similar to a twin needle but consists of three needles attached together.



A sewing machine needle is inserted into the needle bar so that the grooved side faces the direction from which the needle is threaded. The ***needle bar*** is a bar suspended from the head toward the base of the machine. It moves up and down to form stitches. Procedures for inserting sewing machine needles are outlined in the manufacturer's instructions for each sewing machine. Blunt, burred (rough), or bent needles should be replaced to prevent stitching problems and harm to fabric. Before a needle can be inserted into the sewing machine, the needle clamp screw must be loosened. The needle clamp screw is a screw that projects horizontally from the needle bar. Although procedures for inserting needles vary according to different sewing machines, the most common procedure for needle insertion is as follows:

- Loosen the needle clamp screw.
- Push the needle up into the clamp as far as possible.
- Make sure that the grooved side of the needle faces toward the last thread guide.
- Tighten the needle clamp screw.

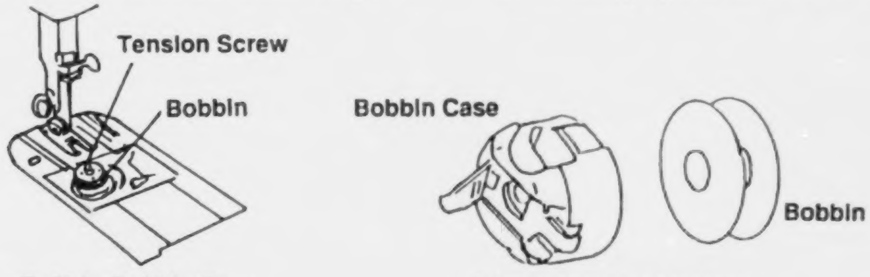
Threading the Machine. Because incorrect threading is often the cause of poor stitching, it is important to learn how to thread the sewing machine properly and wind the bobbin evenly. The presser foot should be raised while threading a sewing machine in order to allow the thread to move easily through the tension discs. The ***presser foot*** is an attachment that holds the fabric against the feed during stitching. The presser foot is raised by lifting the ***presser foot lever***, a lever on the back of the sewing machine. The take-up lever should be at its highest point during threading so that the needle will be easy to reach and will not become unthreaded when stitching begins. The ***take-up lever*** is a part of the sewing machine that controls the amount of thread pulled from the top thread spool for each stitch. The take-up lever moves up and down as each stitch is made.

Different machines have different numbers and types of thread guides. The thread is threaded through each of the thread guides. The spool of thread is placed on the sewing machine's ***spool pin***, a plastic or metal pin projected from the head of the machine. To thread the sewing machine, the thread is passed through a thread guide near the top left of the sewing machine, passed through the tension discs assembly, passed through another thread guide and into the take-up lever, brought down and passed through about two more thread guides, and inserted into the needle's eye in the proper direction. The location of the last thread guide on the machine indicates which direction to thread the needle. For example, if the thread guide is on the left, the needle is threaded from the left. If the thread guide is on the front of the needle bar, the needle is threaded from the front. The last thread guide may also be on the right or on the back of the needle bar.

Preparing the Bobbin. There are many different devices for winding thread onto bobbins. On most sewing machines, bobbin thread is wound on the bobbin by use of a bobbin winder. The ***bobbin winder*** may be on the top, front, or side of the machine. It includes a place to attach the bobbin and winds thread from the spool to the bobbin. The thread from the spool on the spool pin passes through thread guides and a tension disc that lead the thread to the bobbin winder. It is important that thread is wound evenly on the bobbin. Uneven winding of a bobbin can result in uneven stitch tension.

There are different types of bobbin cases in different types of sewing machines. In some sewing machines, the bobbin case is covered by a ***slide plate***, a metal plate that slides forward to open the bobbin area. Different types of bobbins are designed for use in different sewing machines. A ***drop-in bobbin*** is used in a sewing machine that has a built-in bobbin case. A ***built-in bobbin case*** is one that is not removed from the machine. A ***special drop-in bobbin*** is used in a machine that has a bobbin-winding device built into the bobbin case. With this type of machine, the upper portion of the sewing machine is threaded and the bobbin rotates and fills as the needle moves up and down. A special drop-in bobbin is made of clear plastic and usually the top half of the bobbin is larger than the bottom half. A ***removable-case bobbin*** is used in a machine that has a removable bobbin case. The removable bobbin case is a small metal compartment that must be lifted out of the machine in order to remove the bobbin. Figure 14.4 illustrates two types of bobbin cases.

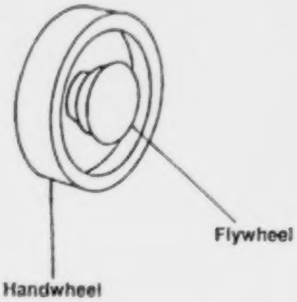
On some machines, the flywheel must be loosened to stop the needle and take-up lever from moving up and down as the bobbin is



Built-In Bobbin Case

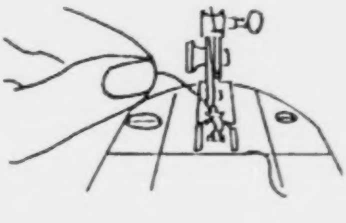
Removable Bobbin Case

Figure 14.4



wound. The ***flywheel*** or ***stop motion screw*** is located on the inside center of the sewing machine's handwheel. The ***handwheel*** is a wheel on the right side of the machine that controls the movement of the take-up lever; it can be turned by hand to raise or lower the needle. The handwheel is held and the flywheel is turned to loosen the flywheel.

After preparing the bobbin, the bobbin is placed inside the bobbin case. The procedures used to thread the bobbin case are different for each different type of sewing machine. Therefore, it is important to follow the manufacturer's instructions to learn correct bobbin threading procedures.



Raising the Bobbin Thread. After placing the filled bobbin in the bobbin case, the top thread (which has been threaded through the needle's eye) is held in the left hand and the handwheel is turned with the right hand until the needle enters the bobbin area and comes back up, bringing the bobbin thread with it. The bobbin thread is looped over the needle thread. The needle thread is pulled up to bring out more of the bobbin thread and its loose end. The two threads are then passed under and behind the presser foot in preparation for stitching.

◆ Essential Questions: ◆
Sewing Machines

1. What are four types of conventional sewing machines? Describe each type.
2. What major sewing machine parts are involved in the formation of stitches? How are stitches formed?
3. How should the tension and stitching on a conventional sewing machine be adjusted?
4. What are the five basic types of sewing machine needles? How is the proper needle selected?
5. What steps are commonly followed to insert a needle in the machine?
6. Why is it important that thread be wound evenly on the bobbin?

INDUSTRIAL SEWING MACHINES

Employment opportunities at apparel manufacturing plants require sewing machine operators to use fast, power-driven, industrial sewing machines. These machines are heavier and sew much faster than conventional machines. Industrial sewing machines are used by manufacturing plants, tailoring and dressmaking shops, drapery workrooms, alteration workrooms, and clothing maintenance businesses. Trained industrial sewing machine operators can find employment even though they have had little work experience. Any person who has sewing skills and can operate industrial sewing machines can easily learn specific sewing techniques.

Industrial sewing machines are usually either lock stitch or chain stitch machines. Stitches formed by lock stitch machines look the same on both sides of the work and resemble stitches made by conventional sewing machines. Stitches formed by chain stitch machines look the same on the top as those formed by the lock stitch machines but resemble a chain on the bottom.

Different industrial sewing machines produce various types and classes of stitches. In apparel manufacturing, these stitches are often identified by numbers. For example, type 100 stitches are formed with a single thread that is threaded through the eye of the sewing machine needle. No bobbin is used to produce type 100 stitches which are called chain stitches. Chain stitches are easily removed by simply pulling the end of the thread from the last stitch formed. Since the stitches are formed with one thread, an entire line of stitching can be easily removed by pulling the end thread. The 300 class stitches, also called lock stitches, single needle stitches, and plain stitches, are the most commonly used stitches in apparel manufacturing. A sewing machine must have a bobbin in order to produce lock stitches.

Types of Lock Stitch Machines

Single-Needle Lock Stitch Machine. ***Lock stitch sewing machines*** use at least two threads to produce stitches. The top thread goes through the needle, and the bottom thread is wound on a bobbin. Figure 14.5 provides an illustration of a basic lock stitch industrial sewing machine. The ***single-needle lock stitch machine*** is the most common industrial sewing machine. It is used to stitch

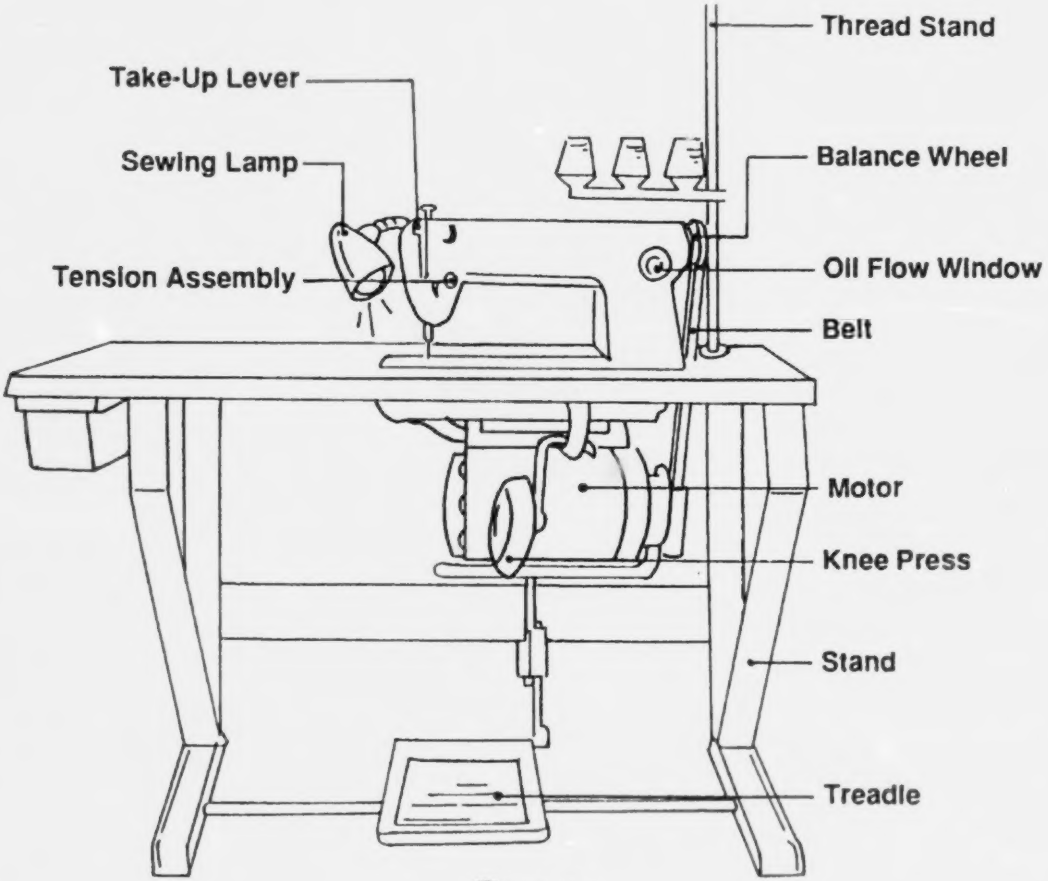


Figure 14.5

the seams on most garments. The stitches will not ravel easily and are less elastic than the chain stitch.

Multi-Needle Lock Stitch Machine. A ***multi-needle lock stitch machine*** uses more than one needle, tension assembly, and bobbin. On some machines, several needles are positioned side by side, and the same number of bobbins as needles are used. The machine produces several parallel rows of stitching at one time. Each needle forms one row of lock stitches. The two-needle lock stitch machine sometimes has a folder for making flat-felled seams, folded seams used on shirts and jeans.

Zigzag Lock Stitch Machine. Lock stitch machines can have as many as thirty-six needles for making many rows of stitching in one operation. They can be used with attachments to produce smocking designs, embroidery, and various decorative stitches. The ***zigzag lock stitch machine*** is threaded similarly to the single-needle lock stitch machine. Zigzag stitches are made by both forward and side-to-side motions and can be adjusted in length or width. In sewing, the single-needle lock stitch machine and zigzag lock stitch machines differ in the way they turn corners. The needle in a zigzag machine must be at its highest point to turn a corner. The needle in a single-needle lock stitch machine must be at its lowest point.

Types of Chain Stitch Machines

Chain stitch sewing machines produce a more elastic stitch than a lock stitch. Chain stitches ravel easily and may be used for seams that do not receive much stress. They are also used for basting, tacking, and sewing on buttons.

As mentioned previously, a bobbin is not used in a chain stitch machine. Instead, a ***looper***, a hook with an eye and thread channel in it, is used. The needle moves up and down while the looper moves back and forth. The looper may or may not be threaded.

Single-Thread Chain Stitch Machine. The ***single-thread chain stitch machine*** has few moving parts and uses one spool of thread. The looper does not carry a thread but moves in various directions to produce a simple chain of stitches. These chain stitches ravel easily.

Two-Thread Chain Stitch Machine. The ***two-thread chain stitch machine*** produces seams that are fairly strong and flexible because a second thread is used. Parallel rows of stitching can be produced when more than one needle is attached to the machine. This machine may be used to make flat-felled seams and is often used to sew sleeves and trouser legs.

Bottom Covering Chain Stitch Machine. A ***bottom covering chain stitch machine*** may have two, three, or four needles. Each needle has a needle thread. These threads are chained together on the underside of the fabric being sewn.

Top-and-Bottom Covering Chain Stitch Machine. The ***top-and-bottom covering chain stitch machine*** carries one more thread than the bottom covering chain stitch machine uses. A device carries the thread and weaves it among the rows of stitching on the top side of the fabric. This type of chain stitching is used on knitted underwear, swimwear, and foundation garments.

Serger. The serger is used to trim and seam all weights and types of fabrics. The ***serger***, also known as the ***overlocker*** or ***overedge machine***, trims the edges of the seams and then overcasts the edge of the fabric with a chain stitch to prevent raveling. When serging is used to overcast and seam at the same time, more than one thread is used. Sergers may use as many as six threads, depending on the type of seam being made. Some sergers will finish the fabric edge and at the same time make an additional row of stitching. This stitching is referred to as a row of safety stitching, which reinforces the stitching on the fabric edge.

Threading a serger is a time-consuming process requiring tweezers and threading wires. The serger is easy to operate but requires a skilled operator because of its speed. The plies of fabric must be kept straight and even because most sergers have trimming attachments that trim the edges evenly before they reach the needle. Sergers are often used on knits and stretchy fabrics.

Blind Stitch Machine. The ***blind stitch machine*** produces a stitch that is almost invisible on the outside of the garment. This machine is used for hemming. It uses one thread and a curved needle that moves from side to side to make a stitch similar to a handmade hemming stitch. The needle goes only partly through the fabric to which the hem is being attached. Blind stitch machines may be adjusted for fabrics of different weights since the thickness of fabrics vary. The adjustment is made by changing the position of the ridge over which the fabric passes. If the ridge is set too low, the needle does not catch the fabric, and the hem is not sewn. If the ridge is set too high, the needle goes through the outer fabric, allowing the stitches to show on the right side.

Types of Automatic Sewing Machines

Various types of automatic machines are used to complete specific tasks. To operate an automatic machine, the fabric is placed in a clamp on the machine and the machine is started. The clamp moves the fabric in a programmed pattern and stitches are sewn. The machine automatically stops and the fabric is released.

Lock Stitch Tacker. The ***lock stitch tacker*** is a machine that is used to make small stitching patterns. Sometimes these stitching patterns are used to reinforce seams or stress points or to attach small pieces of fabric such as loops or labels. Different models of lock stitch tackers are available that are used for various tasks such as sewing on buttons and snaps.

Buttonhole Machine. The ***buttonhole machine*** can be either an automatic lock stitch machine or a chain stitch machine. It is equipped to sew, cut, and trim the threads on buttonholes. After the fabric is clamped into the machine and the machine is started, the machine automatically performs its functions. The machine can make one buttonhole at a time or an entire row of buttonholes.

The length of the buttonhole and the width of the bight can be adjusted on each side. The ***bight*** is the width of the stitch or the distance the needle moves from left to right when making a stitch other than a straight stitch. The space between the two rows of zigzag stitches and the number of bar tack stitches at each end of the buttonhole can also be adjusted.

Buttonholes and threads can be cut automatically. The buttonholes are cut by a cutting knife that is located behind the needle bar. Most machines also have a lever to stop the knife from cutting if an uncut buttonhole is needed. Straight buttonholes are usually cut after the buttonhole is finished and are called ***cut-after buttonholes***. Some machines cut the buttonhole first and then stitch around the edges of the cut. These are called ***cut-before buttonholes***. Unless the fabric has considerable body, it may gather and pleat during stitching if cut first.

Some buttonhole machines have a button to stop the machine at any point in the cycle. The machine may be stopped if the thread breaks or if any other problem develops. When the stitching is started again, the machine will continue from the same spot where it stopped. The buttonhole machine should be tested by sewing on a scrap of fabric. A buttonhole can be started on a scrap of fabric and stopped at the same point where stitching on the original piece of work was stopped. The work can be placed back in the machine and the buttonhole finished without any indication that the machine was stopped.

Button Sewer. The ***button sewer*** automatically attaches buttons, snaps, hooks, and eyes. The button sewer is either a lock stitch or a single-thread chain stitch machine that stitches a zigzag pattern in practically the same place instead of moving the material forward. The machine will sew a pre-set number of stitches a pre-set distance apart. The button sewer can be adjusted to sew on either two-hole buttons or four-hole buttons. The button sewer also will sew on buttons that vary in size and shape and it has a special clamp to hold shank-type buttons.

The button sewer does not have a feed mechanism. Instead, it has a raised or cylinder bed to make it easy to reach any area of a garment. The work is placed under the clamp and the button is placed in the jaws of the clamp. Some machines have a ***hopper***, a dispenser that drops one button at a time into the clamp. The work must be placed in the exact spot where the button is to be sewn. The button must be lined up with the holes exactly under the needle to prevent breaking the needle. Then, the machine automatically sews on the button and cuts the thread at the end of the sewing cycle.

Decorative Stitch Machine

A ***decorative stitch machine*** adds design to a garment in the form of a monogram, embroidery, edge scalloping, or rows of fancy stitching. Decorative stitches are made by using cams to form the sewing design. Although the stitch is made automatically, the operator must feed and guide the work. Different thread colors can be used on two-needle machines to create a decorative effect. Attachments are often used with these machines. For example, a trimming attachment may be used when scalloping edges of fabric to trim away excess fabric below the scalloped edge.

Use of Industrial Sewing Machines

Many of the sewing machine parts and functions discussed in the previous section on conventional sewing machines are similar to those found on industrial sewing machines. Thus, a thorough understanding of the conventional sewing machine helps one understand how an industrial sewing machine functions. Because of the similarities between conventional and industrial sewing machines, this section primarily addresses information that is unique to the industrial sewing machine.

Figure 14.5 may be used to review the parts of industrial sewing machines. Parts found on most industrial sewing machines include the switch, needles, thread take-ups, tension assemblies, thread guides, feeds, throat plates, and machine beds. Lock stitch machines have bobbins, shuttles, and hooks to carry the bobbin thread. Chain stitch machines have loopers which may or may not be threaded with a bottom thread. Sometimes parts or attachments have more than one name.

As with conventional sewing machines, the head is the main part of the machine. The bed is the flat base of the machine that contains the bobbin and bobbin case. The following parts of an industrial sewing machine perform specific tasks:

- ***table*** - The table supports the sewing machine.
- ***stand*** - The stand consists of legs that support the table.
- ***motor*** - The motor is the power unit that drives the machine. The motor continuously turns and has a built-in clutch and a built-in brake.

- ***treadle*** - The treadle is a platform on which the operator's feet are placed. The treadle controls the motion of the machine.
- ***knee press*** - A knee press is used to raise and lower the presser foot as the knee is pressed against it and released. The knee press is mounted under the table.
- ***balance wheel*** or ***machine driving pulley*** - The wheel on the right side of the machine's head is called the balance wheel or a machine driving pulley. The wheel may be used by hand to position the needle up or down while the machine is stopped. The wheel receives the driving force from the belt while the machine is in operation.
- ***belt*** - A belt rotates around the balance wheel and drives the wheel. The belt is attached to the drive of the motor which is located under the sewing machine table. The belt transmits power from the motor to the machine driving pulley.
- ***thread stand*** - The thread stand is positioned above the machine head to the right side of the machine. It holds one or more cones of thread.
- ***sewing lamp*** - A sewing lamp is a light that is usually attached to the back left side of the sewing machine head. It directs light on the needle area so that work can easily be seen. The sewing lamp can be adjusted and positioned as needed.

The needle used on industrial sewing machines can be straight or curved. For example, blind hem needles are curved. Basically, the same guidelines discussed in the section on conventional sewing machines apply to using a needle for an industrial sewing machine.

Procedures for Stitching. After the looper (on chain stitch machines) or shuttle hook in the bobbin case (in lock stitch machines) catches the needle thread loop to form the stitch, the thread take-up lever pulls the loop of thread free and tightens the stitch. The tension assembly controls the flow of thread as the stitches are formed. The tension assembly usually consists of two pressure discs, a tension spring, a thumb-nut pressure control, a tension mounting bar, and the pressure release unit. Some sewing machines have a check spring to help measure the thread flow. The thread must be guided between the pressure discs so that the thread presses against the tension bar constantly as the machine sews.

Thread guides help control the thread as it travels from the thread spool or cone to the needle. There are thread guides at various places on the machine head between the spool, the tension assembly parts, the take-ups, and the needle to ensure that the thread flows evenly. Guides can be found in the following forms: eye, hook, spring, snap, slot, pigtail, tube, and groove.

As with conventional sewing machines, the presser foot holds the fabric as the needle makes each upward motion. The presser foot also provides a smooth surface for the fabric to slide against as the feed makes its forward motion. The presser foot and the feed work together. The pressure applied to the presser foot must be adjusted depending on the weight of the fabric. The pressure regulator is found in different locations on different industrial machines. The presser foot is lowered for sewing and raised for positioning or removing work. It may be raised or lowered with a lever on the back of the machine head or with a knee press.

The operator can choose different shapes and sizes of presser feet depending upon the sewing task. The presser foot can be used with other attachments, such as folders, guides, or devices for shirring, cording, or welting. The presser foot can also serve as a margin guide or as a support for thread cutters or any other device used behind the needle.

The feed moves the fabric forward between stitches. It makes one forward motion for each stitch. Stitch length is usually stated in stitches per inch (S.P.I.). The stitch length may be adjusted, usually from eight to twenty-two, with the stitch regulator. The teeth of the feed must be sharp enough to catch the fabric without cutting or damaging it. The teeth are slanted so that they do not drag the fabric on the backward stroke. If the teeth on the feed are dull, the feed mechanism will not move the fabric forward properly.

The throat plate provides a surface over which the material passes as it is stitched. The feed fits in the throat plate to help move the fabric under the needle. The throat plate has a hole for the needle to pass through. This hole must be the correct size and shape for the needle and the stitch used. The hole can be round, pear-shaped, or slotted. Adaptations can be made in the throat plate and the feed when attachments are used.

As with conventional sewing machines, the bobbin and its case (in a lock stitch machine) fit into a shuttle. The most common types of shuttles are the oscillating shuttle and the rotary shuttle.

Procedures for Winding Bobbins. Most lock stitch machines have a bobbin winder mounted on the right side of the machine near the belt. The bobbin winder is used to wind thread around a bobbin. The bobbin thread is used as the bottom thread in the sewing operation. When the lever on the bobbin winder is pushed forward, the pully touches the machine belt with enough pressure to wind the bobbin. The bobbin winder can be adjusted if the pressure against the belt is not correct. Once the bobbin winder is in the correct position, however, it is rarely necessary to readjust it.

Thread from a cone on the spool stand is threaded down into the bobbin and wound around it a few times before the bobbin winder is engaged. If the thread does not spread evenly over the bobbin, the tension bracket can be adjusted until the thread does spread evenly. The bobbin should not be wound so full that it does not fit in the bobbin case easily. A spring on the bobbin winder can be adjusted until the bobbin winds with the correct amount of thread. Unless prewound bobbins are used, new bobbins should be wound ahead of time so bobbins are ready when they are needed.

Functions of Loopers. Instead of a bobbin, the chain stitch machine has a looper that is sometimes threaded. The looper performs the same function as the shuttle hook. Its point must meet the needle at the right time to catch the loop of the top thread. The main difference between the bobbin and the looper is that new bobbins must be constantly wound and replaced on the lock stitch machine, while the bottom thread from the looper comes from a large cone on the thread stand. On some machines a loop spreader helps the looper function by making the needle-thread loop bigger.

Machine Beds. Machine beds can be horizontal or vertical. Types of horizontal machine beds include flat, cylinder, raised, feed-off-the-arm, and post. The two vertical types of beds are closed and open. Several different beds are used in sewing operations because one operation may be easier to perform using one bed type than another. Table 14.1 illustrates types of horizontal machine beds.

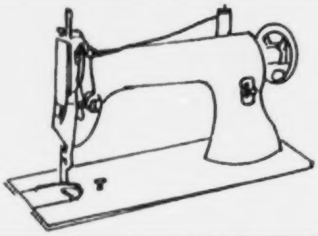
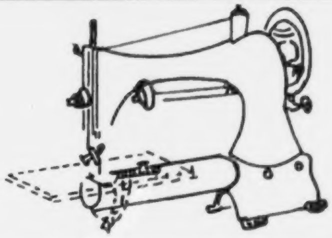
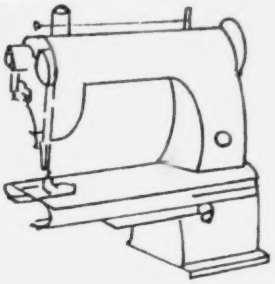
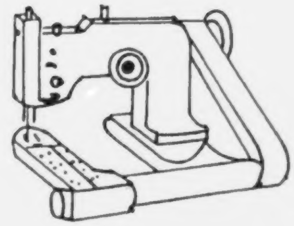
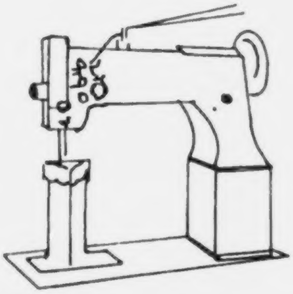
Flat Bed The flat bed is the most common type of machine bed. It is used when work is laid flat for sewing.	
Cylinder Bed The cylinder bed is tube shaped and is used for sewing concave or tubular items. This bed would be useful for sewing around items such as pants cuffs.	
Raised Bed The raised bed is similar to the cylinder bed but it is used for larger tubular items. For example, a dress hem might be sewn on a raised bed.	
Feed-Off-the-Arm Bed The feed-off-the-arm bed has a free narrow arm that allows stitching to be done free of a work surface. Its main function is performing tasks such as closing sleeves and legs. The support for the machine with this type of bed is usually a pedestal.	
Post Bed The post bed is used for sewing places that are hard to reach such as the inside of a handbag. The article, such as the handbag, is placed over a post under the needle bar with its sides suspended around the post.	

Table 14.1

◆ Essential Questions: ◆ Industrial Sewing Machines

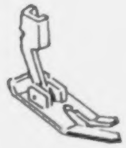
1. How do stitches formed by lock stitch machines differ from stitches formed by chain stitch machines?
2. What are three types of lock stitch machines? What are common uses of each machine?
3. What are six types of chain stitch machines?
4. What are three examples of automatic sewing machines? What functions are performed by each?

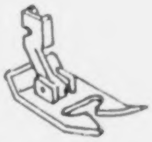
SEWING MACHINE ATTACHMENTS

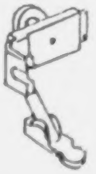
An ***attachment*** is a device used with a sewing machine to increase efficiency or produce special effects. Attachments can increase speed and efficiency and may often perform three or four sewing jobs in one operation. Various types of attachments are available for conventional and industrial sewing machines. Attachments are made to roll, fold, insert, or guide the plies of fabric so that they arrive in the desired position at the needle. Attachments can be removable or built into the machine. They may or may not be interchangeable on different sewing machines. Machines with built-in attachments are sometimes called converted machines. The throat plate, presser foot, and feed may have to be altered to fit some attachments.

Presser Feet

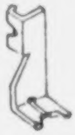
Many different types of presser feet are available for use with sewing machines. Each foot performs a specific task. The ***straight stitch foot*** is the ordinary presser foot that is used for single-needle, straight stitching. It is a narrow foot with one side shorter than the other side. The ***zigzag foot*** is used for zigzag stitching or straight stitching. It is wider than the straight stitch foot and both sides are the same length. The ***zipper foot*** is used to stitch any seam that has more bulk on one side than on the other. This foot is also used to insert zippers, sew bound buttonholes, and cover cording. The ***invisible zipper foot*** is used to insert a special type of zipper called an invisible zipper. The bottom of the foot has two channels through which the zipper coils pass while the zipper is being stitched.

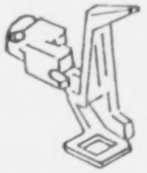

Straight Stitch Foot


Zigzag Foot


Zipper Foot

The ***button foot*** is used to sew on buttons by machine. The button foot holds a button in place while stitching is done. The ***buttonhole foot*** is used to stitch buttonholes and may be made of metal or plastic. The ***embroidery foot*** is used to stitch decorative patterns on fabric. There are grooves in the bottom of the foot that allow dense embroidery stitching to pass easily under the foot. A ***cording foot*** has a built-in device that allows cord to be fed and attached to the fabric being stitched. An ***overedge foot*** is used to place stitches over the edge of fabric. A metal bar holds the fabric edge in place so the stitches will be placed properly by the overedge foot.


Button Foot

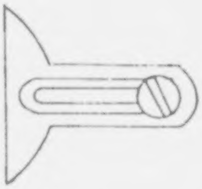

Embroidery Foot

Width Gauges and Edge Guides

Width gauges are probably the simplest of all attachments. The ***width gauge***, or ***edge guide***, is an attachment that helps in stitching a specified distance from the edge of the fabric. Most fabric is not stiff enough to hold its shape when pressed against the side of a width gauge. The fabric must be fed correctly through the width gauge to produce seams of correct widths or stitching that is specified distances from the edges.

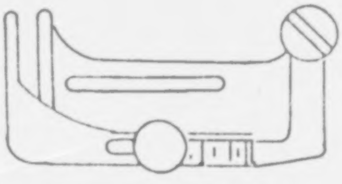
Two main types of width gauges are used. One type, the ***bed-type width gauge***, is attached to the bed of the machine with a thumb screw or slotted screw. The other type, the ***foot-type width gauge***, is made as a part of the presser foot. The bed-type gauge allows greater flexibility. The foot-type gauges are used mainly for narrow seams.

Many varieties of bed-type width gauges are made. The single-setting, double-margin setting, and multi-margin setting width gauges are used most often. All of these are attached to the bed of the machine with screws that fit into open slots. A ***single-setting gauge*** allows an operator to sew only one width setting by using the gauge as a guide.



Single-Setting Gauge

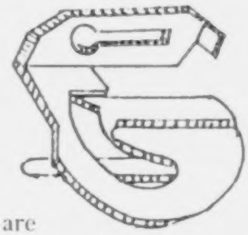
The ***double-margin gauge*** has two walls and allows more flexible measurements. The front wall (on the left) is attached to an arm that can be swung away by the operator without unscrewing the gauge. A different setting remains on the fixed arm or second wall. The front arm of this gauge has an adjusting screw so that the operator can set the two walls apart at any distance. For example, the first wall may be set for a 3/8 inch width and the second or inner wall may be set for a 3/4 inch width. The gauge is used when the width of a seam is changed or when only the front arm of the gauge is needed. The operator can swing the gauge out of the way to sew without any gauge at all. For this reason, it is sometimes called a swing gauge. The ***multi-margin gauge*** also is called the ***butterfly gauge***. It has three types of edges. It is used when the work being sewn has both straight and curved edges.



Double-Margin Gauge

Hemmers

Another frequently used attachment is the hemmer. The ***hemmer*** is an attachment that will roll or fold the edge of fabric to form a hem. Some hemmers are part of a special presser foot while others are attached to the machine bed with screws. A ***folding hemmer*** makes a wide fold and is usually attached to the machine bed rather than to the presser foot. A ***rolled-edge hemmer*** rolls and holds a narrow hem while the hem is being stitched. Hemmers are often used with other attachments to perform tasks such as inserting stiffening, elastic, or trim.



Hemmer

Folder

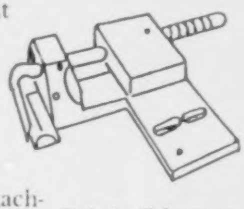
A ***folding attachment***, or ***folder***, functions as the hemmer does but on more than one ply of fabric. This attachment folds fabric into the desired seam shape before it is fed under the needle. There are many varieties of folders for different tasks. For example, a folder can be used to add a binding to an edge. A folder can be used in combination with other attachments, such as those that add tape, lace, rickrack, or other decorative trims.

Lapped Seam Attachments

Lapped seam attachments can be used on one-needle, two-needle, or multi-needle machines. The double-lapped seam is a widely used type of seam closing. It is frequently used on men's shirts, women's blouses, and trousers. The fabric is slid into the attachment from the sides. Accurate feeding is essential. The operator must hold each ply at the proper tension to ensure that the plies will finish evenly.

Cutting and Trimming Attachments

Thread cutters can be automatic or manual. A knife cuts the thread after the seam is finished while the needle is at its highest position. The ***fabric trimmer*** attachment is used to cut away extra fabric while a seam is sewn. The trimming may be performed by a knife built into the machine or by an attachment. Attachments are adjustable for different seam widths. Trimming-off attachments are often used in sewing French seams and with sergers.

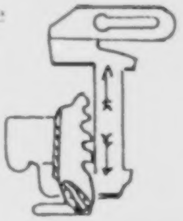


Fabric Trimmer

A ***knife attachment*** can be used to cut between two rows of stitching as when making slit pockets or buttonholes. Another type of knife attachment cuts sewn fabric into specific lengths such as those needed for belt loops. Cutting attachments are even available to pink seams as they are sewn. The ***chopper-type pinker*** cuts one triangle from the fabric with each downward motion of the needle bar. When using the ***rotary pinker***, the fabric is pressed between two wheels and pinked as the seam is sewn.

Attachments for Adding Trim

Various attachments are available for adding trim. Rolls of trim are usually fed automatically from one spool into an opening in the attachment. The spool of trim may be placed on top of the table, under the table, or beside the sewer. Trim can be fed on the top or bottom of the seam or even between plies. The trim can be fed through the presser foot, through a bed attachment, or through a combination attachment. The sewer starts the operation and keeps the trim from becoming twisted. A ***binder*** is an attachment that positions fabric and binding (trim that binds the edges of fabric plies) so they can be fed under the needle together and stitched.



Binder

Cording and Welting Attachment

A ***cording and welting attachment*** automatically feeds rolls of cord or tape between two plies of fabric and sews the cord or tape into a seam while the seam is being stitched. A cording and welting attachment can be used with other attachments to create a variety of decorative effects.

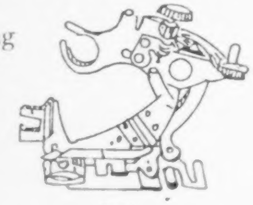
Pleating Attachments

A ***pleating attachment*** folds a series of pleats. The pleats can be folded either one after the other or at regularly spaced distances. The number of pleats of a specific size that can be made from a specific length of fabric can be predetermined. The fold is controlled by the pleating attachment, and the spacing is controlled by the stitch length regulator. The fabric must be fed into the pleater at an even rate.

Gathering and Shirring Attachments

Gathering and shirring attachments gather fabric. **Gathering** is the process of drawing a specific amount of fabric into a smaller area by using one or several lines of stitching. Gathers are soft, even folds of fabric. Gathering is used for decorative purposes and during garment construction for tasks such as setting in sleeves or gathering fabric onto a yoke. **Shirring** is primarily a decorative method used to control fullness in a garment. Shirring is formed with multiple rows of gathering.

One gathering attachment is a gathering foot, a special type of presser foot. The **gathering foot** gathers up a length of fabric as it is being stitched. Some gathering feet will gather one ply of fabric while stitching it to a second ply of fabric that is flat. A **ruffler attachment** is a larger attachment that quickly gathers a length of fabric.



Ruffler

Gathering attachments are sometimes used to form ruffles. A **ruffle** is a strip of fabric cut and manipulated to produce fullness. A ruffle is gathered on one side while the other side is left without gathers. Ruffles can be applied to the top, middle, or bottom ply of work by using attachments. Ruffling also can be performed on a single ply that is then attached to another ply. Rows of ruffles can be applied to the same piece of fabric. Ruffles can be continuous or spaced at regular intervals.

◆ Essential Questions: ◆ Sewing Machine Attachments

1. What are five examples of presser feet? How is each used?
2. What are five examples of other types of sewing machine attachments? What are the functions of these attachments?

CARE OF SEWING MACHINES

It is important to keep sewing machines in good condition by cleaning, oiling, and servicing them regularly. The manufacturer's instructions for each machine include information on how to clean and oil the machine. The regularity of cleaning a sewing machine depends on how much it is used. A sewing machine that is used daily in apparel manufacturing or custom sewing should usually be cleaned daily. Lint from fabric collects around the bobbin area and the needle bar. If left uncleaned, this lint can eventually clog the machine and harm it.

The following general guidelines should be followed when cleaning a sewing machine:

- Disconnect the machine from the electrical outlet.
- Wipe the base of the machine with a soft cloth to remove lint and fuzz.
- Move the needle bar to its lowest position and wipe it with a soft cloth to remove lint and fuzz.
- Open the slide plate and remove the throat plate in order to clean the bobbin case area.
- Tilt the sewing machine head back if necessary in order to reach the bobbin case and other areas under the base of the machine.
- Clean the bobbin and bobbin case by brushing gently with a soft brush.
- Remove any large accumulations of lint from around the feed and bobbin case area.

- Remove old oil by wiping sewing machine parts with a soft, clean cloth.

Every sewing machine must be oiled on a regular basis. The manufacturer's instructions include specific guidelines regarding where to oil each sewing machine. High grade sewing machine oil should be used. For conventional sewing machines, usually only one drop of oil is placed in each appropriate location. After oiling the machine, it is best to wipe the machine with a clean cloth to remove any excess oil. The machine should then be plugged into an electrical outlet and tested. Stitching should be done on a sample of fabric to ensure that all excess oil is removed. This step is important because excess oil can stain fabrics being sewn.

Industrial sewing machines require much attention in terms of oiling. Without the right amount of oil applied properly, various moving parts will not operate correctly. As a result, heat builds up and sewing machine parts may be damaged. Most modern industrial machines have fully automatic lubrication systems. A lubrication system allows oil to be circulated continuously to all parts of the machine that require lubrication. The operator must monitor the oil supply to ensure that enough oil is available for the lubrication process.

Most industrial machines have an oil reservoir under the bed of the machine. The side of the reservoir has "high" and "low" marks. The level of oil in the reservoir must be kept between these two marks. The sewer should tilt the machine head back each day to clean it. At this time, it is important to check the oil reservoir level. If the oil level is much below the "high" mark, oil should be added. It is important to use only a high grade sewing machine oil supplied by the employer. On most industrial machines, there is an oil flow window located on the front of the sewing machine head. When the lubrication system is working properly, a steady stream of oil can be seen flowing behind the oil flow window. If the stream of oil stops or becomes uneven, the machine should be stopped immediately, and a mechanic should check the machine.

While the industrial sewing machine head is tilted back, it is important to clean the oil pump that is located inside the base of the machine. An oil pump screen covers the oil pump. The screen should be cleaned with a soft cloth to remove any build-up of lint or dirt. Any other accumulations of lint, fabric, oil, or dirt found under the base of the machine should be cleaned. Figure 14.6 provides illustrations of the areas under the base of an industrial sewing machine, the oil reservoir, and the oil flow window.

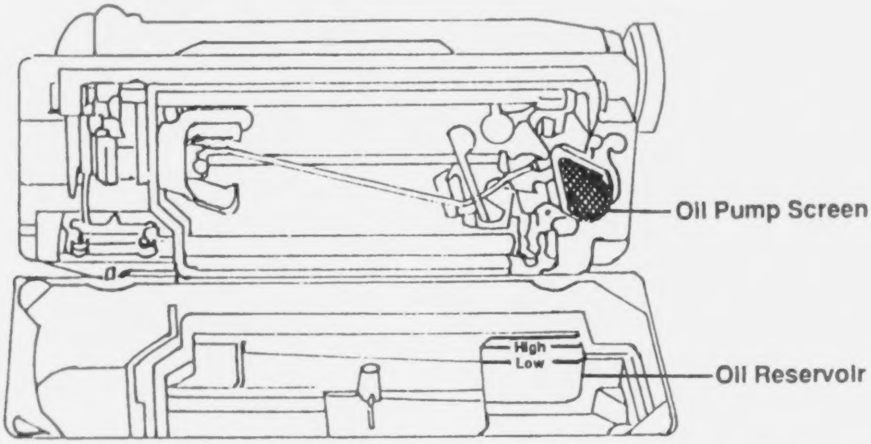


Figure 14.6

Sewing Problem	Possible Causes and Solutions
Broken needle thread	Sharp or rough surfaces over which the thread passes (such as thread guides, tension assembly, take-up lever, needle, throat plate, bobbin, bobbin case, looper, presser foot, and feed); improper threading; poor quality thread; adjustment of top thread tension too tight; needle incorrectly positioned in needle bar; damaged needle; wrong size needle; stitching without having take-up lever at highest position; interference with turning of thread spool or cone; dirt or lint packed under throat plate; machine out of adjustment.
Skipped stitches	Interference with the top thread loop formation caused by lack of control of fabric; wrong needle size; needle hole in the throat plate too large; incorrect type of presser foot, feed, or throat plate; needle incorrectly positioned in needle bar; poor quality thread; fabric interfering with thread loop formation by clinging to needle; damaged, dirty, or oily needle; lint packed in bobbin case area where thread loop is formed; incorrect setting and timing of machine.
Breaking of bottom thread	Burrs (roughness) on the underside of the throat plate and edges of feed; bottom tension too tight; sharp edges on bobbin case tension spring or on surfaces over which the bobbin passes; too much friction of bobbin against the spindle on which it is supported; improperly wound bobbin; improperly threaded bobbin case; burrs on looper; incorrect timing of the machine.
Looping or loose stitching	Incorrect tension setting; wrong thread or needle size for fabric; rough surfaces over which the thread passes; friction on the top thread due to fabric that slows the pulling up of the loop; interference with free passage of the top thread around the bobbin case; dirt or lint packed in the shuttle hook area; loose bobbin case, loose bobbin case latch, or improperly threaded bobbin; wrong needle plate used.
Poor feeding of fabric	Improper setting of the presser foot or feed; incorrect feed timing.
Irregular length of stitches or puckering of fabric	Presser foot not holding fabric securely; feed dragging fabric on its backward stroke due to incorrect timing; wrong style or wrong size needle; blunt point on needle; tension too tight; needle hole in throat plate too large; excess pulling and stretching of fabric while stitching; feeding too much fabric while stitching.
Cutting of fabric on the underside	Feed too high; too much pressure on presser foot; rough spots on throat plate or attachments; feed teeth too sharp, worn, or chipped.
Soiling of fabric	Improper cleaning of machine; use of wrong lubricant; oil flow too great.
Machine is noisy	Machine needs oiling; blunt needle; threads hung in shuttle hook area; dirt, lint, or oil between throat plate and feed; loose parts or loose belt; feed set too high; loose bobbin case.
Bending or breaking of needles	Pulling of fabric while sewing causing needle to strike throat plate; portions of fabric too thick or heavy for needle size; blunt point on needle; loose needle clamp screw; hole in throat plate too small; loose throat plate; loose presser foot; top thread too heavy for needle; stitching over basting pins; timing of thread take-up lever needs adjustments; timing of feed and needle need adjustments.

Table 14.2

Sewing machine operators can learn to make some adjustments and simple repairs to their sewing machines. This reduces the loss of production time while the operator must wait for a mechanic. Apparel manufacturing plants have mechanics on duty to make complicated adjustments and repairs. Operators should never attempt to make repairs or adjustments that they are not trained to perform.

The following warning signals can alert an operator when repairs are needed:

- unusual noises in the machine or motor
- excessive oil accumulation on the outside of the machine
- smoke
- excessive lint, threads, and fabric in and around the sewing and drive-belt area
- machine running faster or slower than normal
- unusual vibrations
- any part of the machine becoming unusually hot
- odors caused by burning electrical insulation, hot oil, overheated metal, or burning thread

Table 14.2 includes information on possible causes of and solutions for various sewing problems.

◆ *Essential Questions:* ◆
Care of Sewing Machines

1. What determines how often a sewing machine should be cleaned?
2. Why is it important to check the oil level frequently on an industrial sewing machine? How is the oil level checked?
3. What are examples of warning signals that a sewing machine may need repair?

MISCELLANEOUS SEWING EQUIPMENT AND TOOLS

Besides sewing machines, a variety of equipment and tools are necessary to produce textile and apparel products. In textile and apparel manufacturing plants, large industrial equipment is used for various steps in the manufacturing process. In custom sewing, dressmaking, and tailoring, tools and equipment much like those used in home sewing are utilized. This section of Chapter Fourteen includes information on basic equipment and tools used in the cutting, marking, and sewing processes. Detailed information on tools used for measuring is included in Chapter Sixteen.

Cutting Equipment and Tools

Equipment. There are various methods used to cut fabric. ***Cutting*** is the actual severing of fabric into various garment parts. In apparel manufacturing plants, cutting is a process that includes spreading fabric on large cutting tables, severing the fabric into garment parts, and notching or marking pieces using another method. Before cutting can be done in a manufacturing plant, fabric must be spread on tables.

Spreading is the laying down of many layers of fabric, each on top of the preceding one, into a stack. Several methods and machines may be used for spreading. Spreading allows for many plies of fabric to be cut at the same time to increase efficiency. The oldest method of spreading involves suspending a roll of fabric on a pipe over one end of a cutting table. Two employees, called spreaders, grasp opposite ends of the pipe and walk to the opposite end of the table pulling fabric off the roll onto the table as they walk. The spreaders continue to walk back and forth from one end of the table to the other spreading multiple layers of fabric on top of each other. The stack of fabric is referred to as the ***spread*** or the ***lay***. In some situations, the lay may be stacked to a height of 6 inches.

The most modern and accurate method of spreading is done by using a spreading machine. The ***spreading machine*** consists of a device on which a roll of fabric is suspended on a revolving rod above a carriage on wheels. The carriage moves up and down the length of the table as it unrolls fabric. Various attachments may be added to spreading machines. For example, some spreading machines are adjustable so they may be used on tables of different widths. Most spreading machines have an electronic eye attachment that automatically aligns one edge of each lay with each preceding edge. Some spreading machines have cloth inspection devices attached. These devices provide extra lighting so that the employee guiding the spreading operation can note defects in the fabric before it is spread. Some spreading machines have a small step attached to the side of the machine on which an employee can stand. The step moves along beside the table as the spreading machine is propelled along.

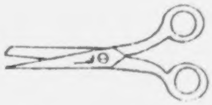
No one single cutting method is best for all manufacturing purposes. In manufacturing, cutting methods include the following: vertical knife, band knife, circular knife, die cutting, computer driven knife, water jet, laser, plasma cutters, and automated cutting techniques. Different segments of the manufacturing industries choose different cutting techniques depending on the products they manufacture and the costs involved. Vertical knife cutting is the most common cutting method used in apparel manufacturing. This method involves an electrically driven blade that moves up and down rapidly. The blade is suspended from a head that is mounted on a vertical arm. The entire arm is mounted on a chrome base so it can be moved easily on a table surface. An employee called a cutter manually guides the device to cut the lay.

Automated cutting techniques have been developed by several companies. ***Automated cutting systems*** involve the use of a very slender needle knife that is suspended from a bar above the cutting surface. The tiny knife does not disturb the lay very much so that very accurate cutting is done. The knife electronically senses when it is not at a right angle to the fabric edges and corrects itself automatically. It also sharpens itself automatically during the cutting process at predetermined intervals. The knife cuts at the rate of 300 to 1200 inches per minute. A computerized system is used to determine how garment pieces are cut.

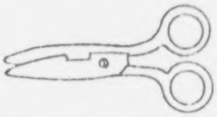
An automated cutting system is often mounted on tracks that are attached to the floor. The cutting device is moved on the tracks to the end of a cutting surface. The lay of fabric that has already been spread is moved by a special conveyor that allows the fabric to be moved without stretching or disturbing it. The top ply of the lay is covered with a plastic film once it is on the cutting surface. The special cutting surface is designed to allow a vacuum to be applied to the lay of fabric. Tufts of bristles form the cutting surface and holes are spaced between the tufts. These holes allow a vacuum to extract air from the fabric by a suction process. The vacuum process reduces the height of the lay by more than 50 percent and holds the plies of fabric firmly together to prevent movement during cutting. A lay of fabric cannot exceed 3 1/2 inches in height if it is to be cut by an automated cutting system.

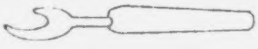
Other methods of cutting in apparel manufacturing settings are not as frequently used as those previously described. ***Laser cutting*** involves the use of a laser cutter that is attached to a bar above the cutting area and extends the width of the cutting area. Carbon dioxide gas is used to sever the fabric and leaves a fused edge on fabrics made of certain types of manufactured fibers. The fusing process seals the edges of fabric and eliminates the need for seam finishing to control fraying. ***Water jet cutting*** involves the use of a fine stream of water propelled under great pressure to cut fabric.

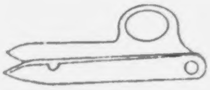
Tools. Accuracy is essential when cutting out garments. Even edges, obvious notches, and true curves make sewing simpler and more accurate. If a garment's pieces are cut even 1/8 or 1/4 inch larger or smaller than the pattern piece, the garment will be a different size than intended. A variety of cutting tools are available as sewing aids.

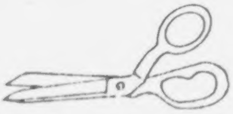

Sewing Scissors

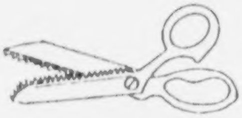
Embroidery Scissors

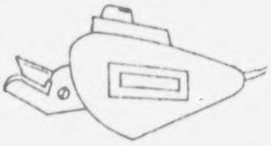

Buttonhole Scissors


Seam Ripper


Thread Clippers


Bent-Handled Shears


Pinking Shears


Electric Shears

Shears, pinking shears, and scissors are used for sewing done by custom sewers, dressmakers, tailors, and alterationists. ***Sewing scissors*** are used for snipping threads, trimming, and clipping. These scissors are pointed, have two handles that are the same size, and have blades 5 to 6 inches long. ***Trimming scissors*** or ***thread scissors*** are usually about 4 to 6 inches long. They are used for small cutting tasks such as clipping threads. ***Embroidery scissors*** are 3 to 4 inches long and are used for tasks such as cutting corners of bound buttonholes and embroidery work. ***Buttonhole scissors*** are small scissors that are primarily used to cut open buttonholes.

Seam rippers are used for removing stitching from fabric and are 3 1/2 to 4 inches long. A seam ripper has a pointed end for picking up stitches and a razor-like edge for cutting the stitches. ***Thread clippers*** fit in the palm of the hand and are squeezed to press the pointed blades at the end of the clippers together in order to cut threads. A spring mechanism makes them spring apart between clips.

Shears are used to cut fabrics and have two cutting blades that make the shears at least 6 inches long. The two handles are shaped differently to fit the hand comfortably. ***Straight-handled shears*** are used for general sewing tasks. They range from 6 to 12 inches in length. The most popular size is 7 to 8 inches long. ***Bent-handled shears*** are 7 to 9 inches long. The bent handle makes cutting more accurate because it allows the fabric to rest closer to the cutting surface as it is cut.

Pinking shears are used to finish seams by trimming while automatically making a zigzag cut or scalloped cut. ***Electric shears*** are available in both electric and battery-powered models. They can cut quickly and accurately with less stress on the hand and are especially useful for reducing the physical effort of cutting heavy fabrics or large quantities of fabric. Shears should be selected based on the cutting task to be done.

Cutting surfaces should be at least 30 inches wide and 48 inches long. A more ideal area would be 38 inches high, 36 or more inches wide, and 6 to 8 inches long. The surface should be accessible from all four sides to make pattern layout and cutting easier. In an apparel manufacturing plant, cutting surfaces may be quite long and large. A ***cutting board*** is a portable cutting surface made of heavy cardboard and is marked with a grid. A cutting board protects the table top from damage, and it folds for storage.

Marking Equipment and Tools

Equipment. An activity closely related to the cutting process in apparel manufacturing is the marking of multiple garment pieces.

Since speed is very important in mass production of apparel, marking techniques may be used that are quite different from those used by employees who sew for individual clients. ***Position marking*** is a marking technique that involves cutting tiny slashes at appropriate locations in garment pieces. These slashes serve as guides for sewing machine operators to help them in matching seams, placing pockets, and locating folds or stitches for tucks, pleats, and darts.

Drill holes, small holes created in fabric by automated cutting systems, are sometimes used to position darts, pockets, and plackets. Drill holes can only be used in certain types of fabrics and must be placed carefully because they leave permanent holes in fabric. Another marking technique involves the injection of a marking fluid through a hollow needle. This method eliminates the placement of permanent holes in fabric. Different types of fluids are used. The markings made by some fluids can only be seen under black light; other fluids produce markings that can be seen under conventional lighting. Other marking techniques used in apparel manufacturing involve the use of chalk, powder, and other manual marking devices. These techniques involve marking each lay of fabric individually and are slower than the techniques described previously.

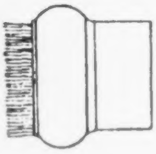
Marking for shade is a technique used in apparel manufacturing that helps gather bundles of garment pieces from the same shade group. Since large volumes of fabric are used in apparel manufacturing, the shading of different rolls of the same type of fabric may differ slightly. Good quality garments are made from fabric that comes from the same shade group so that the fabric of all pieces in one garment match. A machine called a Soabar may be used to mark every cut piece. This machine automatically attaches a ticket (a tiny gummed paper stamp) to each garment piece. Each stack of identical garment pieces cut from a single lay of fabric is clamped together. Each ply is individually stamped by the Soabar machine with consecutive numbers. The process can begin by numbering the bottom ply or the top ply of each stack, but all stacks must be numbered consistently for the process to work correctly. During the sewing process, all garment pieces with identically matched numbers are brought together to form a single garment of perfectly matched fabric.

Tools. Marking tools are essential for custom sewers, tailors, dressmakers, and alterationists. Marking is done to transfer pattern symbols found on pattern pieces to the fabric. Pattern symbols identify specific construction details. Information on pattern symbols is included in Chapter Eighteen. Marking tools and techniques are selected based on the type and weight of fabric being marked.

A ***tracing wheel*** is a marking tool that consists of a wheel attached to a handle. The wheel may be a sawtooth tracing wheel for marking sheer or delicate fabric (without carbon paper), a blunt-tooth tracing wheel for marking most fabrics (with carbon paper), or a smooth-edged tracing wheel that is usually used on knit fabrics (with carbon paper). Slight pressure is applied as the tracing wheel is rolled along a pattern symbol. ***Dressmaker's carbon paper*** is used with some tracing wheels to transfer pattern symbols to the wrong side of fabric. Carbon paper is available in different colors and has one side that is coated with a waxy substance. The paper is placed between fabric plies, and color on the waxy side is transferred to the fabric as the tracing wheel is rolled across it.

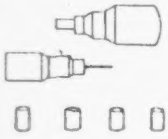
Tracing Wheel

Tailor's chalk is a clay based, chalk material that is used to mark fabrics. Tailor's chalk is available in white, black, and colors. The most convenient chalk forms are squares that come in a refillable plastic holder (tapered to a fine edge on two sides) and hand-held roll-ing dispensers filled with chalk powder. Tailor's chalk is used to mark silk, cotton, linen, wool fabrics, and fabrics made from manufactured fibers. Since chalk will rub off easily, it is used primarily when altering or constructing garments that will be completed quickly.



Tailor's Chalk

Tailor's wax is a marking material made from white or colored wax in the form of a square. Like tailor's chalk, it is tapered on two sides so that the fine edges may be used for marking. This material is primarily used by tailors and alterationists when constructing or altering wool garments since it leaves a stain on many other fabrics. The wax can be removed from wool fabrics by pressing since heat causes the wax to disappear. A ***tailor's tack marker*** is a small device used to mark with chalk simultaneously on the opposite faces of two plies of fabric. The device consists of two parts that each contain chalk. Each part is positioned on opposite faces of two plies, and chalk marks are made on the fabric. It may be used instead of thread markings or when a tracing wheel would damage the fabric.



Tailor's Tack Marker

A ***dressmaker's marking pencil*** is a form of tailor's chalk used for most hard-surfaced fabrics. It consists of chalk constructed in the form of a pencil and usually has a brush at one end to brush chalk markings away. Various types of dressmaker's marking pens are available. Dressmaker's marking pens use special types of ink. For example, some pens contain ink that disappears from fabric within twenty-four hours. Other pens contain ink that is visible on the surface of fabric until the fabric is moistened. The ink marks disappear when moisture is applied. These pens are usually used with washable fabrics since moisture may spot or stain fabrics that must be dry cleaned.

Dressmaker's Marking Pencil

Thread markings are made using a hand needle and sewing thread. Two types of thread markings are tailor's tacks and hand basting. ***Tailor's tacks*** are used to mark fabrics when carbon paper and marking pencils or pens cannot be used. Procedures for making tailor's tacks are included in Chapter Eighteen. ***Basting*** is a temporary stitching technique used for various purposes including marking fabrics. Glazed mercerized cotton is used to make thread markings on most fabrics; silk thread is used for fine fabrics and when stitches are not to be removed before pressing. It is best to use white or light-colored thread since dark colored threads may leave a permanent smudge on fabric if pressed.

In addition to their other uses, straight pins are sometimes used to temporarily mark fabrics. Pinning is not as accurate as other marking methods. Straight pins, discussed in table 12.2 of Chapter Twelve, are available in brass, steel, or stainless steel. They may have ballpoints, large heads (made of glass or plastic), T-shaped heads, or flat heads. Glass or plastic ball head pins are easier to see and handle than flat-head pins. T-head pins are particularly useful when sewing pile fabrics and loose knits. Rust-proof stainless steel or brass pins are used with most fabrics. Pins are available in various sizes which are identified by numbers. The longer the pin, the thicker it is in size. Long, thick pins are used for heavy fabrics; shorter, thinner pins are used for medium-weight fabrics. Short, fine pins are used for lightweight, special, or delicate fabrics. Ballpoint pins are recommended for knit fabrics because the ballpoint tip separates and passes between yarns rather than penetrating and cutting yarns.

Pin cushions are firmly stuffed pillows available in a variety of shapes and sizes. Some pin cushions are attached to a clip that may be held on the wrist for convenience. Some pin cushions have an emery bag attached. The ***emery bag*** is a small cushion stuffed with a special granulated material that cleans and sharpens pins and hand sewing needles. Magnets are sometimes used to locate pins that are dropped while sewing. Magnetic pin cushions hold pins by magnetic force.

Pin Cushion

Emery Bag

Sewing Tools and Supplies

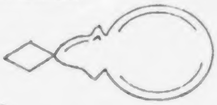
Small hand tools and supplies are important to the appearance of the finished garment. Quality workmanship is not possible without having the proper tools and supplies available. Important tools in the sewing process are items such as needles, thread, and thimbles. Each of these tools contributes to the appearance of the finished product. For example, a needle that is too coarse will leave holes in the fabric. A blunt needle can snag or pull fabric threads. The wrong thread can cause seams to pucker or break when the garment is worn.

General hand needles are used for general-purpose sewing. The types of general hand needles include sharp, between, milliner, ballpoint, and calyx-eye needles. Each type of general hand needle is described in table 12.2 of Chapter Twelve. Other types of needles are used for needlecraft, darning, and heavy-duty sewing. These various types of needles are also described in table 12.2.

Sewing machine needles are selected according to the weight and type of fabric sewn. Various types of machine needles are described in table 12.2. In addition, types of points available on different sewing machine needles are described on page 227 under "Using Sewing Machine Needles."

Special hand tools and supplies include needle threaders, tissue paper, transparent tape, tweezers, loop turners, pliers, emery boards, bodkins, awls, pointer and creasers, embroidery hoops, lap boards, and plumb line.

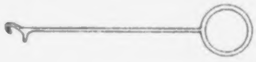
A ***needle threader*** is a diamond-shaped loop of flexible, fine wire attached to a small flat metal or plastic plate. It is used to help thread hand and machine needles. The threader is inserted through the eye of the needle; thread is then inserted through the eye of the needle threader. The threader with thread is pulled back through the needle resulting in a threaded needle.



Needle Threader

Tissue paper is a thin, flexible paper that may be used to prevent the sewing machine feed from marring certain fabrics, make pattern alterations, or transfer monograms and designs. ***Transparent tape*** can be used as a guideline for topstitching, to mend torn patterns, or to secure pattern alterations. Transparent tape also is useful for holding a zipper in place for topstitching. ***Self-sticking sewing tape*** is a special tape with measured markings on one side. It is used as a stitching guide and is especially helpful when topstiching. ***Tweezers*** can be used to remove tailor's tacks, gathering threads, basting threads, and threads or knots that accumulate in a sewing machine. ***Serger tweezers*** are used for threading and replacing serger needles and loopers.

A ***loop turner*** is a rigid wire that is approximately 10 inches long. It has a latch and hook device at one end to attach to the fabric and aid in turning tubing. The other end has a ring handle to hold. The loop turner is used to turn narrow tubing, straps, strips, trims, or belts. It may also be used to pull material such as elastic

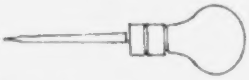


Loop Turner

through a casing. A ***bodkin*** is a blunt, needle-like tool designed for pulling material or elastic through a casing. There are different types and sizes of bodkins. One type has a safety-pin type closing, and another type resembles a large-eyed needle. A third type resembles a large tweezer. The bodkin may also be used to turn narrow belts and sashes.

Bodkin

An ***awl*** or ***stiletto*** is a sharp, metal tool with a wooden or plastic handle that is used to make holes for eyelets or keyhole buttonholes. The awl may also be used to punch holes in leather, plastic, or fabric or to mark placement of pockets, trim, or bands on patterns. The point is very sharp and should be covered with a snug-fitting cover for safety. Small pointed ***pliers*** are useful for straightening or mending metal trims or buckles.


Awl

The ***pointer and creaser*** is a flat tool with one end pointed and the other end rounded. The pointed end pushes out corners. The rounded end is used with the iron to flatten seam lines or assist in finger pressing. An ***embroidery hoop*** holds fabric taut for embroidery, beading, or monogramming work. A ***lap board*** for use over the arms of a chair provide a solid work surface for hand work when working in a chair instead of at a table.

A ***plumb line*** is a heavy cord with a metal weight tied to one end. It is used to check center front, center back, and side seams. For center front and back seams, seam tape is tied around the person's neck, and the plumb line is attached to the seam tape. To check side seams, the plumb line is tied to a small, flat board about 6-by-2 inches in size, and the board is placed high under the arm. The plumb line provides a line for judging the direction of seams and grain lines.

◆ Essential Questions: ◆ Miscellaneous Sewing Equipment and Tools

1. What is spreading? What are two methods of performing the spreading process?
2. What different methods of cutting may be used for manufacturing purposes? Which method is most common?
3. What are five examples of scissors or shears? What is the function of each?
4. What types of marking equipment are used in apparel manufacturing?
5. What are the functions of the following marking tools: tracing wheel, dressmaker's carbon paper, tailor's chalk, tailor's wax, dressmaker's marking pencil, dressmaker's marking pens, straight pins, and pin cushions?

Chapter Highlights

- ☆ Sewing skills, taking care of tools and equipment, and developing good working habits are all important aspects of employment in the textile and apparel industries.

(Continued on page 250)

Chapter Highlights

(Continued from page 249)

- Types of conventional sewing machines include straight stitch machines, zigzag machines, automatic stitch machines, and electronic or computerized machines.
- Every employee who operates a sewing machine should be familiar with the parts of the machine and how they function.
- Various parts of the conventional sewing machine help the sewer perform different tasks including the following: forming stitches, adjusting tension, adjusting stitching, threading the machine, preparing the bobbin, and raising the bobbin thread.
- Since all conventional sewing machines are somewhat different, it is important to follow the manufacturer's instructions when operating a conventional sewing machine.
- Sewing machine operators should know how to start stitching, control the machine's speed, and stop smoothly at the desired spot.
- Types of industrial sewing machines include lock stitch, chain stitch, automatic, and decorative stitch machines.
- Many parts and functions of conventional sewing machines are similar to those of industrial sewing machines. However, there are additional features on industrial machines that cause them to function differently than conventional machines. Additional features found on many industrial machines include the treadle, knee press, balance wheel, belt, thread stand, and sewing lamp.
- Various types of sewing machine attachments are available for both conventional and industrial sewing machines. Attachments include the following: presser feet, width gauges and edge guides, hemmers, folders, lapped seam attachments, cutting and trimming attachments, attachments for adding trim, cording and welting attachments, pleating attachments, and gathering and shirring attachments.
- It is important to keep sewing machines in good condition by cleaning, oiling, and servicing them regularly. The regularity of cleaning a sewing machine depends on how much it is used. Machines used daily should be cleaned each day. Manufacturer's instructions and general maintenance guidelines should be followed for caring for sewing machines.
- Sewing machine operators should be alert to notice warning signals that indicate the need for sewing machine repairs.
- A variety of miscellaneous equipment and tools are used for different sewing tasks.

Chapter 15

Pressing Techniques and Equipment

Chapter Focus

The following Essential Knowledge and Skills are discussed in this chapter:

5A Describe types, uses, and care of equipment, tools, and supplies used in apparel production.

5E Utilize established production procedures and processes to achieve quality standards in finished products.

7E Demonstrate proper selection, use, and care of equipment and products for cleaning, laundry, and pressing tasks.

Chapter Vocabulary

dry press
ironing
presser
pressing
steam press
wet press

Read chapter sections for additional terms related to types of pressing equipment.

Employees apply pressing techniques in various settings within the textile and apparel industries. Pressing techniques are used in apparel manufacturing, custom sewing, alterations and mending, and laundry and dry cleaning operations.

This chapter covers basic techniques that are applicable to any setting. Special emphasis is given to pressing techniques used during apparel construction and in laundry and dry cleaning.

PRESSING TECHNIQUES DURING CONSTRUCTION

Pressing is the action of alternately pressing down and lifting up a heated iron on fabric without using any gliding movement. ***Ironing*** is the action of sliding a heated iron back and forth over fabric to smooth wrinkles. Pressing is gentler to fabrics than ironing and does not rub finish off the surface of the fabric as ironing does.

The purpose of correctly pressing or ironing textile and apparel products is to preserve the original texture and finish of the fabric. When textile and apparel products are ironed or pressed properly, the fabric nap does not appear shiny, flat, or rough. In addition, iron marks and imprints from darts, seams, or zippers do not appear on the fabric.

Basic Pressing Techniques

Heat, moisture, and pressure are the three essential ingredients needed to press most fabrics. The amount of each ingredient varies with different types of fabrics. Too much heat can damage fabric and cause shine. Therefore, using the correct temperature is important when pressing. Moisture is also needed for pressing most fabrics. In some cases, moisture can cause spots, change texture, or give an overpressed look.

Pressure should usually be applied lightly when pressing. Some wools may require application of more pressure than other fabrics. A pounding block or clapper is used on such fabrics to flatten any areas that require extra pressure. An important rule to remember is that pressing is not the same as ironing. Pressing involves lifting the iron and setting it down, not pushing the iron.

The following rules should be used to determine the pressing requirements of specific fabrics:

- Test before pressing. The effects of pressure and heat should be tested on a fabric scrap or in a less noticeable area to determine the best technique for the fabric. The results should be compared with an unpressed area.
- Check the fabric's reaction to steam and moisture. Do not use too much of either steam or moisture.
- Press on the wrong side of the fabric when possible. When it is necessary to press on the right side of the fabric, use a press cloth.
- Become familiar with the characteristics of different fabrics and avoid over pressing.

Pressing is as important as stitching in apparel construction. In the textile and apparel industries, the presser is a skilled technician. A ***presser*** is an employee who presses garment details while garments are being constructed or presses constructed garments that have been laundered or dry cleaned. To get a professional look in garments being constructed, the presser must press each construction line before a sewer crosses it with another seam. Pressing is also very important during the alteration of a garment. It is impossible to construct a garment that has a professional appearance if pressing is not done during the construction process.

Various types of pressing equipment are used by apparel manufacturers, dry cleaners, commercial laundries, and custom sewers. Apparel manufacturers and dry cleaners use commercial pressing equipment that is especially designed for different pressing tasks. For example, when shaping fabric is fused to a jacket front in an apparel manufacturing plant, a ***buck***, a convex-shaped pressing surface, may be used. A second concave pressing surface known as a ***hot head*** is brought down and held on the fabrics to permanently fuse the fabrics together. Many custom sewers and alteration businesses use conventional pressing equipment that is commonly used in home sewing. Although equipment may vary according to the employment situation, the same basic pressing techniques are used.

The three pressing methods are dry pressing, wet pressing, and steam pressing. To ***dry press***, the garment is pressed on the wrong side without a cloth. Lightweight fabrics of rayon, cotton, and silk are usually dry pressed. To ***wet press***, a damp press cloth is placed over the fabric and a dry iron is used. To ***steam press***, a steam iron is used with or without a press cloth.

The following guidelines will help pressers and garment makers use pressing techniques effectively during construction:

- Set up pressing equipment near the sewing machine during garment construction or alteration if conventional pressing equipment is used and if one person performs pressing and stitching tasks.
- Use appropriate pressing equipment for each task.
- Use steam to ease, flatten seams, and mold curves. Use heat and moisture, not weight, to shape garments.
- Avoid pressing lengthwise creases in sleeves or lapels.
- Press collars, lapels, cuffs, belts, and pockets on the wrong side first; finish by pressing lightly on the right side while using a press cloth.
- Press embroidery, braid, buttons, and other rough textures from the wrong side over a soft pad, such as a folded towel.

Pressing Construction Details

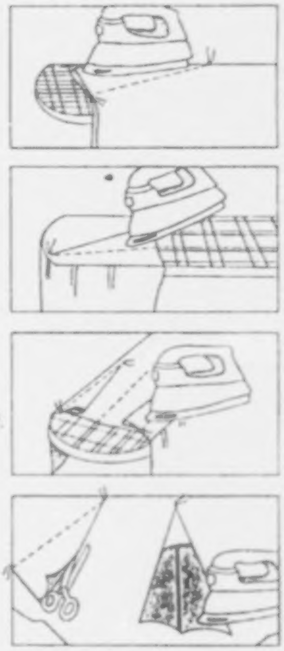
Seams that require clipping or notching should be clipped or notched before they are pressed. A seam is first pressed in the same direction it is stitched. Then the seam is pressed open. Straight seams are pressed on an ironing board, seam roll, needle board, or press table. Curved seams are pressed on a tailor's ham, press mit, tailor's board, or specialized pressing equipment with shaped surfaces.

Darts are extended outward and pressed flat immediately after they are stitched. Then, each dart is pressed in the direction the dart will be positioned in the finished garment. Vertical darts are pressed toward the center of the garment. Horizontal darts are pressed downward. Deep or bulky darts are trimmed and slashed in the centers first; then, they are pressed open. Corners or points may be pressed in several ways. To press corners on a finished edge, the garment section is laid over a point presser. The seam is opened with the tip of the iron. Figure 15.1 illustrates basic techniques used in pressing darts.

Pleats are pinned and basted in the appropriate direction before pressing them. A press cloth is used to press pleats. The entire garment should be supported while pressing pleats to avoid pulling the pleats out of place. Soft pleats should be lightly pressed. Steam is used to set the creases in sharp pleats. Using a damp press cloth placed over the pleats during pressing results in sharper pleats.

After pressing a section of pleats, the pleats should be allowed to dry thoroughly before moving them off the ironing board or press table. Pleats are pressed on the right side of the garment first; then, they are pressed on the wrong side. A press cloth is used on both sides. To remove unwanted ridges that may be formed by pressing, strips of heavy paper are placed beneath each fold and the pleats are pressed again. The basting

Techniques for Pressing Darts



Press dart flat. Do not press beyond point of dart.

Place dart, wrong side up, over tailor's ham or end of ironing board to keep contour of fabric.

Press vertical darts toward center of garment. Press horizontal darts downward. Press diagonal darts downward.

For darts in heavy fabric, cut dart open to within one inch of point. Press dart open.

Figure 15.1

that holds the pleats during pressing are left in the garment as long as possible to help maintain the folds.

Tucks are first pressed from the underneath side of the folds. Using too much steam may result in puckering. Heavy paper should be placed under the folds of wide tucks. A press cloth is used when pressing tucks from the right side.

Ease or fullness may be shrunk out of an area by holding the side of the iron parallel to and a few inches away from the stitching line. The iron is moved across the fullness all the way to the seam line. This method is least effective when used with fabric made from manufactured fiber(s).

To press gathers or shirring, the gathered or shirred item is held firmly at the stitching line with one hand. The point of the iron is guided toward the gathers or shirring with the other hand. Gathers or shirring should be pressed from the wrong side when possible. The heat should be reduced to prevent scorching.

Plackets and zippers are pressed according to the shape of the surrounding garment area. The placket is positioned right side down over a press pad or a tailor's ham. A press cloth and limited moisture are used to prevent puckers. It is best to avoid pressing directly on zipper teeth or coils, hooks and eyes, or snaps. This prevents damage to the items or to the soleplate (bottom) of the iron.

Bound buttonholes should be pressed at several points during construction. Bound buttonholes are pressed from both the right and wrong sides of the garment. Heavy paper is placed between the buttonhole strips and the garment before pressing to prevent creating imprints on the right side.

The same pressing techniques used to press buttonholes should be used to press pockets. After the pocket is stitched to the garment, the pocket is pressed from the right side using a press cloth. For welt or flap pockets, heavy paper is placed between the garment and the welt or flap. After pressing from the right side, the garment is turned to the wrong side. The garment and pocket are pressed along seam lines using a press pad. If the bottom portion of the pocket is not attached on the inside of the garment, the pocket should be raised in order to press the portion of the garment underneath the pocket.

During construction, hems are pressed lightly to shrink out excess fullness and to make the hem fold. It is important to check hem seam lines and the grain line of the hem allowance. These hem seam lines and the hem grain line should line up with the garment's seam lines and grain line. Heavy paper should be inserted in the hem fold to prevent a ridge from forming on the outer fabric during pressing. After the hem is stitched, it is pressed a second time using a damp press cloth. The iron's point is positioned perpendicular to the hem and toward the garment. The iron is placed on a portion of the hem, lifted, and placed on another portion of the hem until the entire hem has been pressed.

Final Pressing

Final pressing should only involve touching up if thorough pressing is done during construction or alteration. Final pressing is done to remove wrinkles that come from handling the garment and to touch up edges. The amount of final pressing required depends on the quality of pressing done and care taken during construction or alteration.

Pressing is an important part of the alteration procedures used in retail stores, alteration businesses, and dry cleaners. The customer expects the garment to be ready to wear after alterations are made. After pressing, the garment should be checked to ensure that the desired effect has been achieved without changing the appearance of the garment. When alterations have been performed properly, the garment should satisfy the customer.

Most final pressing is done to the right side of the entire garment. However, it can be limited to the area in which an alteration or repair is made. The rules for using moisture, pressure, and heat during final pressing should be followed. A press cloth should be used when needed.

The following steps should be used when completing the final pressing of a garment:

- Press inside construction details such as pockets, facings, seams, linings, and shoulder pads, if needed.
- Press the collar carefully since it frames the face.
- Press parts that extend from the body of the garment, such as sleeves and sashes.
- Press ruffles and gathers before pressing the parts they trim.
- Press yokes and shoulders before the lower shirt, blouse, or bodice.
- Press the top parts of long garments before pressing the lower parts. For example, press the bodice before the skirt, the skirt top before the lower part of the skirt, and the pants top before the pants legs.
- Hang the garment on a well-padded hanger. Close the zipper and button buttons where necessary to hold the garment on perfect grain. If necessary, pad curves, such as those in sleeves and collars, with tissue paper to help them keep their shapes. Allow the garment to dry completely without crowding it before storing.

The following suggestions may also be helpful in final pressing:

- Press in the same direction as the grain of the fabric.
- Press with the zipper closed. If the zipper is in a curved area of the garment, press with the curve over a cushion.
- Press thick areas (such as collars and belts) on the wrong side first until they are smooth but not dry. Finish pressing with the right side out.
- Use a tailor's ham for pressing the collar and lapel. Press carefully on the lengthwise grain of the collar.
- Do not press creases in sleeves. Use a sleeve roll or magazine inside the sleeve to aid in pressing.
- Press the hem of the garment with the grain of the fabric
- Have wool and tailored garments professionally pressed as needed.

Pressing takes time, patience, experience, proper equipment, and knowledge about grain line, various fabrics, and the contours of garments. A good garment maker cannot produce a professional-looking, high-quality garment without being able to press effectively. In addition, alterationists, laundries, and dry cleaners must use proper pressing procedures for quality service to be achieved.

◆ Essential Questions: ◆
Pressing Techniques During Construction

1. What is the difference between pressing and ironing?
2. What three essential ingredients are needed to press most fabrics?
3. What rules should be used to determine the pressing requirements of specific fabrics?
4. What are three pressing methods? Describe how each is done.
5. What pressing techniques are suggested for the following construction details: darts, pleats, tucks, zippers?
6. What are five suggestions for the final pressing of a garment?

PRESSING EQUIPMENT

Various types of pressing equipment are used by apparel manufacturers, dry cleaners, commercial laundries, and custom sewers. Most custom sewers use conventional pressing equipment similar to pressing equipment used in the home. Employees in apparel manufacturing plants use commercial pressing equipment. Commercial equipment is also used by employees in commercial laundries and dry cleaners. Although the type of pressing equipment used varies in different employment situations, methods of using and caring for pressing equipment are similar.

The type of equipment used depends on the characteristics of the items pressed and the instructions on garment care labels. Using inappropriate pressing equipment can result in a garment with an unpleasing appearance. Failure to follow instructions on care labels can result in damage to textile and apparel products.

Types of pressing equipment include the following:

Foot Press

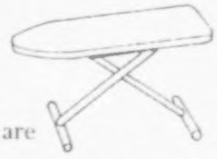
- ***foot press*** - A foot press is a two-piece padded form that applies heat, pressure, and moisture when the upper and lower pressing surfaces are activated by a foot pedal or handle. The form can be flat or curved. Similar pieces of equipment include the steam press and the pressing buck. A foot press is used to press particular parts of garments such as the body of a coat or a collar, to shape and smooth garments, to improve the fit of garments, and to press creases and pleats in garments.
- ***pressing form*** - A pressing form is a collapsible fabric structure that inflates to simulate the shape of a garment. Zippers are located on the pressing form to change the size and shape of different areas. A pressing form applies heat and steam to garments and is used to press an entire garment in one operation, to set the shape of knit garments, and to press garments when hard pressing and flattened seams are not desired. Pressing forms are also used when other pressing methods would stretch or distort garments.
- ***portable steam presser*** - A portable steam presser consists of a lightweight, nonmetallic plate that tapers to a point at one end, a handle, and a chamber that holds water. When the water is heated, it emerges as steam through perforations in the plate of the presser. Portable steam pressers are used to steam garments on forms, to steam garments on hangers, to open seams and darts during the construction process, and to press fabrics that could be damaged by the pressure of a regular iron.
- ***electric puff iron*** - An electric puff iron is a small piece of pressing equipment that is operated by hand. An electric puff iron consists of an oval-shaped metal ironing head attached to a metal stand. Attached to the stand is an adjustable clamp used to attach the puff iron to a base (such as an ironing board). Puff irons are used to press or shape contoured seams, puffed sleeves, ruffles, and pocket details.

Temperature Regulated Iron

- ***temperature regulated iron*** - A temperature regulated iron consists of a handle and a weighted, flat, polished metal plate with a tapered point at one end. Temperature regulated irons have a variety of temperature settings from which to choose, and each setting maintains the chosen temperature. Temperature regulated irons are used to smooth or crease fabrics.
- ***steam iron*** - A steam iron consists of a weighted, flat, polished metal plate that tapers to a point at one end. Steam irons also have handles and chambers that hold water. When the water is heated, it emerges as steam through perforations on the bottom of the iron. Steam irons are

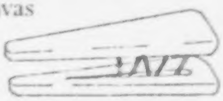
used to smooth or crease fabrics and to set blocked muslin.

- ***steam iron pressure tank*** - A steam iron pressure tank consists of a weighted, flat, polished metal plate that tapers to a point at one end. The iron has a handle and a steam release thumb control through which steam supplied through a hose from a separate chamber is emitted. The heat and pressure in the separate chamber can be adjusted. A steam iron pressure tank is used to crease or smooth fabrics by providing a steady source of steam. It is also used when pressure and heat require adjustment for various types of fabrics.
- ***iron shoe*** - An iron shoe is a metal plate that is perforated and shaped to fit the sole of a steam iron. An iron shoe is used to prevent shine and scorching of fabric, to evenly distribute steam over the ironing surface, and to press fabrics made of manufactured fibers and fabrics such as gabardine and taffeta.
- ***iron stand*** - An iron stand is a piece of flat metal shaped like an iron. Iron stands are used to rest heated irons and to prevent the ironing surface from scorching.
- ***conventional ironing board*** - A conventional ironing board, or small shop ironing board, is a flat, perforated metal board that tapers at one end and is supported at table height. Conventional ironing boards are portable and are usually covered with a fitted cover made of silicone-treated fabric. The purpose of a conventional ironing board is to provide a soft, stable surface on which to press or iron.



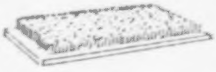
Conventional Ironing Board

- ***industrial ironing board*** - An industrial ironing board is a flat board that tapers at one end and is supported at table height. An industrial ironing board is padded and covered with wool, canvas, or silicone-treated fabric. The cover varies according to the type of fabric being pressed. Industrial ironing boards are permanently fixed to stands or tables and provide a soft surface on which to press or iron.
- ***sleeve board*** - A sleeve board is a small-scale, wooden ironing board with rounded ends and a padded surface covered with silicone-treated canvas or cotton fabric. Sleeve boards are used when pressing sleeves, short seams, areas that are hard to reach, and areas that will not fit on a regular ironing board. Use of a sleeve board prevents creasing that results when sleeves are pressed on a regular ironing board.



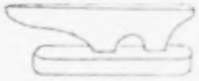
Sleeve Board

- ***needle board*** - A needle board, or ***velvet board***, is a flat board covered with short, blunt wires embedded upright. Needle boards are used to prevent pile and napped fabrics, such as velvet, from being crushed, matted, or flattened during pressing or steaming.



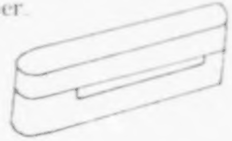
Needle Board

- ***point presser*** - A point presser, or ***collar board***, is a narrow, wooden form with angled edges and a tapered point. Point pressers are used to press and form sharp corners; to press open the seams of points on pockets, collars, waistbands, and lapels before they are trimmed and turned; and to press open seams without pressing nearby fabric. The base of the point presser may be used as a clapper.



Point Presser

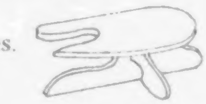
- ***clapper*** - A clapper is a thick, wooden block that is rounded at one end. The terms ***pounding block*** and ***spanker*** are also used to refer to a clapper. Clappers are used to flatten darts, pleats, and seams during pressing; to flatten edges and seams on heavy fabrics such as wool; and to flatten faced edges on hems, collars,



Clapper

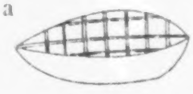
lapels, and buttonholes.

- ***tailor's board*** - A tailor's board is a pressing tool that is made of wood with a number of differently shaped edges and surfaces. A padded cover may be placed on the tailor's board when soft edges are needed for pressing tasks. A tailor's board is used to press flat garment areas, points, and straight and curved seams.



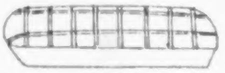
Tailor's Board

- ***seam stick*** - A seam stick is a half-rounded block of wood about 30 inches long and 3 inches wide that is covered with felt, cotton, or silk. Seam sticks are used to prevent impressions of seam ridges from appearing on the face of a garment.
- ***tailor's ham*** - A tailor's ham is a firm, rounded cushion covered with tightly woven fabric. A tailor's ham has a wool pressing surface and a cotton pressing surface and is used to shape collars and lapels, mold shaped areas, and press areas requiring shaping, such as curved darts and seams.



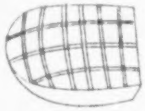
Tailor's Ham

- ***sleeve roll*** - A sleeve roll is a firm, cylinder shaped cushion that is covered with tightly woven fabric. Sleeve rolls consist of a wool pressing surface and a cotton pressing surface. Sleeve rolls are used when pressing sleeves, cuffs, and legs of slacks and pants to avoid misshaping garments and prevent impressions of seam ridges from appearing on the faces of garments.



Sleeve Roll

- ***press mitt*** - A press mitt is a soft, glove-like cushion that can be worn on the hand or placed on a sleeve board. Press mitts are used to shape hard-to-reach areas and to press small details, rounded seams, and sleeve caps.



Press Mit

- ***pressing cloth*** - A pressing cloth is a square or oblong piece of wool, cotton, or linen. Pressing cloths vary in weight and are used to protect fabric surfaces when pressing, to prevent fabrics from becoming shiny when pressed, to protect ornamentation such as monograms and appliqués, and to prevent construction details such as zippers and closings from being damaged. Pressing cloths absorb sizing, starch, and other fabric finishes. Therefore, clean press cloths should be used to obtain desired results.
- ***pressing pad*** - A pressing pad is a soft pad of cotton, foam, or felt. Pressing pads are used during pressing to protect ornamentation such as monograms, embroidery, beading, lace, and appliqués.

When using commercial pressing equipment, guidelines such as the following should be observed:

- Gather all necessary supplies and place within easy reach.
- Clear the floor of the work area of debris.
- Maintain a well-lit work area (with natural lighting when possible).
- Pad pressing surfaces with materials that reflect heat into the items being pressed. Do not use materials that will scorch. Scorching occurs when the fabric surface is discolored or damaged by burning.
- Locate pressing equipment near electrical outlets so cords are not stretched excessively when equipment is used.

◆ Essential Questions: ◆ Pressing Equipment

1. What determines the type of equipment used in pressing? What can result from using inappropriate pressing equipment or failing to follow care label instructions?

2. What are five examples of types of pressing equipment? What are the functions of each?

PRESSING TECHNIQUES FOR LAUNDRY AND DRY CLEANING

When using pressing equipment, laundry and dry cleaning employees should follow set procedures. Pressing procedures have been developed to produce attractive finished products. Professional results can be achieved with conventional or commercial pressing equipment when the following guidelines are observed:

- Understand the proper use of equipment. Review instructional materials or ask for information if necessary.
- Read garment care labels and follow the pressing instructions.
- Sort items to be pressed according to fabric content. Press items requiring the lowest temperature settings first.
- Test the iron on a seam or hidden area of the garment before pressing. Adjust the temperature setting if necessary.
- Press with the grain of the fabric.
- Press on the wrong side of the fabric or use a press cloth if fabric shows a shine on the test area.
- Brush napped or heavy fabrics before pressing.
- Press the outer edges of the wrong side of the fabric first and then work toward the inside of the garment when pressing layered surfaces.
- Press fabrics made from manufactured fibers only when they are completely dry.
- Press fabrics made from natural fibers before they have dried thoroughly.
- Dampen fabrics with mist from a spray bottle if necessary.
- Do not keep the steam surface on any one area of fabric for an extended length of time.
- Check the pressing progress periodically and allow excess steam buildup to escape.
- Do not press soiled, stained, or spotted fabrics. When soiled areas are pressed, spots or stains can permanently attach to the fabric fibers rather than temporarily cling to the surface finish of the fabric.
- Do not use hot pressing equipment on buttons, zippers, sequins, glitter, feathers, rubber, or vinyl. The heat from the equipment can melt or disfigure the fabric or ornamentation.

Satisfactory results can usually be obtained when general pressing guidelines are followed. However, specific procedures should be followed when pressing pants and slacks, skirts, dresses, and blouses and shirts. Examples of procedures to follow when pressing specific garments are as follows:

- pants and slacks - Line up all four leg seams at the cuffs. Place the pants or slacks on the pressing surface so that the front creases remain lined up and are facing forward. Fold the top leg back and press the bottom leg first from the top to the hem. Turn the pants or slacks over and repeat the procedure on the other leg.
- skirts - Turn the skirt inside out and press starting on the back side. Press the waistband.
- dresses - Press collars, yokes, and shoulders first. Turn the dress inside out and press starting on the back side.
- blouses and shirts - Press from top to bottom and back to front. Next, press the underarm, chest, and stomach areas followed by the yoke, collar, and button placket areas. Press the sleeves and cuffs last in order to preserve the professionally pressed appearance.

◆ Essential Questions: Pressing Techniques for Laundry and Dry Cleaning ◆

1. What are five examples of pressing guidelines for achieving professional results?

2. Why is it important to avoid pressing soiled, stained, or spotted fabrics?

3. Why is it important to avoid using hot pressing equipment on details such as buttons, zippers, or sequins?

4. What procedures should be followed when pressing blouses and shirts?

Chapter Highlights

- Pressing involves lifting the iron and setting it down. Ironing involves sliding the iron back and forth over fabric.

- Heat, moisture, and pressure are the three essential ingredients for pressing most fabrics.

- To determine the pressing requirements of specific fabrics, test before pressing; check the fabric's reaction to steam and moisture; press on the wrong side of the fabric when possible; become familiar with characteristics of different fabrics; and avoid over pressing.

- The three pressing methods are dry pressing, wet pressing, and steam pressing.

- Effective pressing techniques should be used to press construction details during the construction process. Details that may require pressing include darts, pleats, tucks, gathers or shirring, plackets and zippers, buttonholes, pockets, and hems.

- Final pressing should only involve touching up if thorough pressing is done during construction or alteration.

- Various types of pressing equipment are used by apparel manufacturers, dry cleaners, commercial laundries, and custom sewers. Both conventional and commercial pressing equipment require similar pressing techniques and methods of use and care.

- The type of equipment used depends on the characteristics of the items pressed and the instructions on garment care labels. Failure to consider these factors can result in an unpleasing appearance or damage to textile and apparel products.

- Laundry and dry cleaning employees can achieve professional pressing results by following general procedures that have been developed. Specific procedures should be followed when pressing pants and slacks, skirts, dresses, and blouses and shirts.

Chapter 16

Measuring for Custom-made Garments

Chapter Focus

The following Essential Knowledge and Skills are discussed in this chapter:

6A Demonstrate correct procedures utilized in garment fitting and alteration.

6D Describe types, use, and care of tools, equipment, and supplies used to alter, repair, and customize textile and apparel products.

Chapter Vocabulary

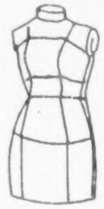
- asymmetrical figure
- basic pattern
- commercial pattern
- ease
- figure types
- form
- pattern drafting
- pattern draping
- personal measurement chart
- production patterns
- sloper

Read chapter sections for additional terms related to measuring tools and measuring women, men and boys, and children.

As described in Chapter Two, tailors, dressmakers, and custom sewers are people who construct garments according to customer specifications. In the apparel design business, sample makers construct sample garments from muslin (a plain-woven fabric made from bleached or unbleached carded yarns) using designers' sketches. Most custom sewers use commercial patterns to construct garments. ***Commercial patterns*** are produced by pattern companies and sold in fabric stores and fabric departments. Consumers use these patterns to construct garments according to their own preferences. These patterns are made according to general specifications of each particular pattern company and may have to be altered (adjusted) for each customer.

Different methods are used to construct patterns. ***Pattern drafting*** is a system of pattern making that depends on a series of form or figure measurements to make a paper pattern. ***Pattern draping*** is a process that involves draping a two-dimensional fabric pattern. A ***form*** is a standardized duplication of a human torso. The form may also be called an industrial form, a model form, or a dress form. Muslin is used to construct the draped pattern on the form or live model. The draped pattern is then transferred to paper, corrected, and used to make a final pattern. Pattern companies use both drafting and draping to develop patterns. Apparel manufacturers and designers also use these methods to construct production patterns, the final patterns used in manufacturing ready-made garments.

The form can be a valuable tool in the construction of custom-made garments. Forms vary in design. In addition to their widespread use in creating patterns for apparel manufacturing, they are used in making custom garments for the following purposes:



- developing original patterns
- fitting sample garments
- altering custom-made garments
- establishing the hemlines of garments

When constructing a custom-made garment, either the pattern or the fabric can serve as an inspiration for the garment. Usually, the pattern is selected first. There are many pattern styles available. Not every pattern style looks equally good on all body types, just as various styles of ready-made garments look different on people of various sizes and shapes. The success of a finished garment depends on the selection of a pattern in the correct figure type and size.

FACTORS TO CONSIDER WHEN MEASURING

Many factors must be considered before a commercial pattern is selected. These factors include the purpose of the garment, influence on current fashion, influence of the elements and principles of design, kind of fabric, figure type, and pattern size. The customer usually considers these factors when shopping decisions are made. However, being aware of the decisions a customer must make can assist the custom sewer, dressmaker, or tailor in developing a good working relationship with the client.

Taking measurements saves time during garment construction if done accurately. Accurate measuring can only be done if concentration and patience are used throughout the measuring process. It is important to note that some clients have asymmetrical figures. An ***asymmetrical figure*** is one with measurements that differ from one side of the body to the other. Actually, most human figures differ to some degree from side to side. For example, one shoulder may be higher than the other shoulder. Such figure differences affect the way clothes hang on the body. If accurate measurements are not taken initially, garments may not fit well in certain areas or hemlines may tilt upward or downward.

In order to record exact measurements, the custom sewer should make a personal measurement chart for each client. Figure 16.1 provides an example of a personal measurement chart used to record body measurements that are vital to the pattern selection and alteration processes. The example provided is for use in recording a woman's body measurements. Personal measurement charts should also be used when custom sewing for men and children.

The sample chart in figure 16.1 includes spaces to record measurements taken in a variety of figure locations. The pattern size selected is determined by exact body measurements. However, the garment made from the pattern is larger than the exact body measurements. A small amount of room is added to the body measurements to allow the person to move easily when wearing the garment. Ease is the difference between the body measurement and the garment measurement at a given point. Note that different amounts of ease are allowed for different parts of the garment. The chart in figure 16.1 provides a space to total each body measurement plus the additional ease allowed. This process allows the custom sewer to calculate how large the pattern should actually be in order to fit the client.

Individuals employed to construct patterns for apparel manufacturers or fashion designers also record body measurements on measurement charts. However, these employees often measure forms rather than live models in order to construct patterns for garments to be manufactured. After a form is measured, a sloper is developed. A ***sloper***, also known as a ***basic pattern***, is a pattern of a garment component (such as a bodice or sleeve) without style lines or seam allowances. The sloper is developed from specific measurements of the form or a live model.

Personal Measurement Chart
(Female)

Client Name ________________ Figure Type ________________
Date ________________ Pattern Size ________________

Measurement Location		Body Measurement	Ease to Add	Total	Pattern Measurement	Alteration Needed
Bust			3" – 4"			
Chest			0"			
Waistline			1/2" – 1"			
Hips	3" below waist		1/2" – 1"			
	7" below waist		2"			
	9" below waist		2"			
Shoulder Length			0"			
Back Width	Upper		0"			
	5" below neck		1"			
Bodice Lengths	Center front		1"			
	Shoulder to bust point		0"			
	Bust point to waist		1/2"			
	Center back		1/2"			
	Over shoulder blade		1/2"			
Arm (Sleeve)	Shoulder to elbow		1/2"			
	Shoulder to wrist		1/2"			
	Girth		2" – 3"			
	Wrist		1/2" – 1"			
Skirt Length	Center front		3" hem			
	Right side		3" hem			
	Center back		3" hem			
	Left side		3" hem			

Figure 16.1

When measuring a client's body for a custom-made garment, it is important to revise the personal measurement chart when figure changes occur. This chart is very helpful in determining each client's pattern size. It can also be used when checking the pattern dimensions for adjustments and alterations.

◆ Essential Questions: ◆ Factors to Consider When Measuring

1. What are the differences in pattern drafting and pattern draping?
2. What factors should be considered before selecting a commercial pattern?
3. What is the purpose of a personal measurement chart? What kinds of information should be recorded on the chart?

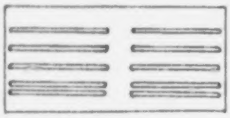
MEASURING TOOLS

Good measuring tools are essential for achieving accurate fit in custom clothing, alterations, and apparel manufacturing. It is important to measure often and accurately in addition to rechecking measurements. A variety of measuring tools are needed by these employees.

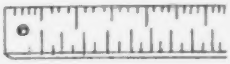
The following measuring tools are used to ensure proper fit and accurate sewing:

- ***tape measure*** - A tape measure is a narrow, firmly woven or plastic tape that is flexible. Most tape measures are 60 inches long and are marked with measurements indicating both inches and metric terms. If each side of a tape measure is a different color, it is easy to tell whether the tape measure is twisted when taking body measurements. The tape measure used by tailors and alterationists of menswear has a special fiberboard piece on the end called a crotch piece. This special tape measure with a crotch piece is used to measure the inseam and outseam of men's pants.

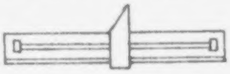
- ***transparent ruler*** - A transparent ruler is usually 1 or 2 inches wide and has a clear, plastic, straight edge. Transparent rulers are available in 6 inch, 12 inch, and 18 inch lengths. A transparent ruler is imprinted with a grid in inches and fractions of inches the length and width of the ruler. A transparent ruler is most helpful when guidelines and marks must be seen through the ruler.



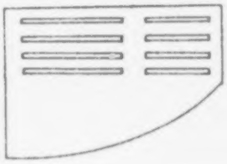
- ***measuring stick*** or ***yardstick*** - A measuring stick or yardstick is a 36, 40, or 45 inch wooden or metal straight-edged ruler with measurements marked in inches and/or metric terms. Some measuring sticks, called vertical rulers, have numbers that are arranged to be read vertically.



- ***ruler*** - Rulers are straight-edged strips of metal, wood, or plastic. They are marked with measurements usually indicating both inches and metric terms. Rulers are available in 6 inch, 12 inch, and 18 inch lengths for use in a variety of measuring tasks.
- ***sewing gauge*** - A sewing gauge is a short ruler that has an indicator slide that can be set at any point along the ruler. Sewing gauges are used in measuring short distances such as hems, in topstitching, and in other detailed work. A pliable 6 inch gauge is recommended.

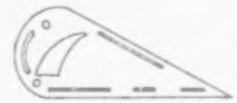


- ***automatic hem gauge*** or ***sleeve gauge*** - An automatic hem gauge or sleeve gauge is a 3-by-5 1/2 inch rectangular guide with graduated markings from 1/4 to 2 1/2 inches. This gauge is used to turn

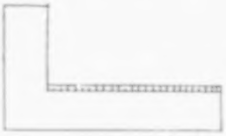


garment hems, sleeve hems, edges of pockets, and edges of appliqué designs. The gauge is placed on the fabric, the fabric is turned up the desired amount, and the item is pressed without having to pin.

- ***skirt marker*** or ***hem marker*** - A skirt marker or hem marker is a ruler attached to a weighted base. It is used to mark hems while a garment is on a form or on a human body. Some hem markers have an adjustable device that releases powdered chalk to mark hems by use of an attached pressure bulb and hose. Other hem markers have an adjustable clamp for inserting pins or marking hems with chalk.
- ***triangle*** - A triangle is a three-sided tool with two sides of equal length, meeting at an angle of ninety degrees. Each of the sides of equal length joins a third side at a forty-five degree angle. The triangle is used to mark corners and angles on patterns.
- ***French curve*** - A French curve or irregular curve is a guide shaped in a spiral curve that aids in altering patterns and in redrawing construction lines. French curves are usually about 10 inches in length.



- ***L square*** or ***tailor's square*** - An L square, or tailor's square, is a metal, wooden, or plastic ruler with two arms of different lengths meeting at right angles. The tailor's square is marked in inches and/or centimeters including fractional measurements. It is used for straightening grains, for altering tissue patterns, and for other marking tasks.



- ***sleigh curve*** - A sleigh curve is a metal or plastic drawing guide with an edge that includes a variety of curves. The sleigh curve is useful for marking and altering curved lines such as darts, necklines, rounded sleeve seams, and curved hemlines.

◆ Essential Questions: ◆
Measuring Tools

1. Why are good measuring tools essential?
2. What are the main functions of the following measuring tools?
   -tape measure
   -tape measure with a crotch piece
   -automatic hem gauge
   -transparent ruler
   -measuring stick
   -ruler
   -sewing gauge
   -hem marker
   -triangle
   -French curve
   -L square
   -sleigh curve

MEASURING THE HUMAN FIGURE

There are specific procedures to follow in measuring the human figure in order to make decisions regarding custom garments. When aligning the tape measure around the body, it should feel snug, but not tight. Measurements are more exact when taken by a person other than the individual being measured.

Ideally, the person being measured should stand barefoot on a flat, hard surface with feet slightly apart and weight evenly distributed. Smooth undergarments that are normally worn should be worn during the measuring process. If desired, the person may wear a close-fitting garment such as a body suit or leotard over undergarments. Bulky clothing items such as sweaters, belts, and loosely fitting jeans should be removed. Measurements should be taken between breathing so that the person maintains a natural, relaxed stance. To measure accurately, it is a common procedure to actually mark the body as each measurement is taken. Washable felt-tip pens are usually used for this purpose.

Measuring Women

A variety of measurements may be taken when choosing a commercial pattern, altering a pattern, or designing a pattern. When choosing a commercial pattern, the size selection is usually based on only a few measurements. The following list describes six basic measurements often used when selecting patterns:

- ***height*** - Height is measured by having the client stand in stocking feet with the back against a wall. The client's posture should be erect but natural. The person measuring should place a ruler on top of the client's head and perpendicular to the wall. A mark is made where the ruler touches the wall and a yardstick or tape measure is used to measure from the floor to the mark.
- ***back neck to waist*** or ***back waist length*** - The back neck to waist, or back waist length, measurement is secured by measuring from the most prominent bone at the base of the neck down to the center back to the waistline. To locate the client's natural waistline, a string is placed around the middle portion of the client's body. When released, the string will move to the natural waistline area.
- ***chest*** or ***high bust*** - The chest, or high bust, measurement is obtained by measuring across the fullest part of the back, under the arms, and above the full bust line. The high bust measurement is not listed on most pattern envelopes. However, if there is a difference of 2 or more inches between the high bust and full bust measurements, the high bust measurement should be used in selecting the correct pattern size.
- ***bust*** or ***full bust*** - The bust, or full bust, measurement is taken by measuring across the fullest part of the back, under the arms, and across the full bust line.
- ***waist*** or ***waistline*** - The waist, or waistline, measurement is taken by measuring around the natural indentation at a person's waist with the tape measure parallel to the floor.
- ***full hip*** - The full hip measurement is usually taken by measuring around the fullest part of the hip area (usually 7 to 9 inches below the natural waist). The person measuring should note the distance from the waist that the hip measurement is taken.

When pattern alterations must be done, additional measurements are needed in order to make the garment fit the body. The measurements listed on the personal measurement chart in figure 16.1 for females are examples of measurements that are helpful in the pattern alteration process. In addition to these basic measurements, the following measurements may by used:

- ***3 inches below waist*** - The abdomen, or 3 inch below waist, measurement is taken by measuring around the body 3 inches below the waistline.
- ***7 inches below waist*** - The 7 inch below waist measurement is taken by measuring around the body 7 inches below the natural waistline.
- ***9 inches below waist*** - The 9 inch below waist measurement is taken by measuring around the body 9 inches below the natural waistline.
- ***shoulder length*** - The shoulder length measurement is obtained by measuring from the base of the neckline to the tip of the shoulder (shoulder bone).
- ***upper back width*** - The upper back width measurement is obtained by measuring across the back from the tip of one shoulder point (top of armhole) to the tip of the other shoulder.
- ***5 inches below neck back width*** - The 5 inch below neck back width measurement is obtained by measuring across the client's back 5 inches below the neckline at right angles to the center back measurement.
- ***center front bodice length*** - The center front bodice length measurement is obtained by measuring from the neckline to the natural waistline.
- ***shoulder to bust point bodice length*** - The shoulder to bust point bodice length measurement is taken by measuring from the middle of the shoulder to the bust

point below the shoulder. The bust point is located at the point of the fullest area of the bust. The bust point on a pattern can be identified by intersecting an underarm dart to cross a dart projecting from the waistline toward the shoulder. The location where the two darts intersect is called the bust point.

- ***bust point to waist bodice length*** - The bust point to waist bodice length measurement is taken by measuring from the bust point to the waistline.
- ***center back bodice length*** - The center back bodice length measurement is obtained by measuring from the neckline to the waistline.
- ***over the shoulder blade bodice length*** - The over the shoulder blade bodice length measurement is taken by measuring from the middle of the shoulder to the waistline. The tape measure is kept parallel to the center back.
- ***shoulder to elbow*** - The shoulder to elbow measurement is obtained by measuring from the shoulder bone to the elbow with the client's arm slightly bent.
- ***shoulder to wrist or arm length*** - The shoulder to wrist or arm length measurement is taken by measuring from the shoulder bone to the wrist with the arm slightly bent.
- ***girth or arm circumference*** - The girth or arm circumference measurement is obtained by measuring the circumference of the arm beginning and ending about 1 inch below the armpit.
- ***wrist*** - The wrist measurement is secured by measuring the circumference of the wrist at the wrist bone.
- ***center front skirt length*** - The center front skirt length measurement is obtained by measuring from the natural waistline at the center front to the location where the lower edge of the garment ends.
- ***right side skirt length*** - The right side skirt length measurement is obtained by measuring from the natural waistline at the right side of the body to the location where the lower edge of the garment ends.
- ***center back skirt length*** - The center back skirt length measurement is taken by measuring from the natural waistline at the center back to the location where the lower edge of the garment ends.
- ***left side skirt length*** - The left side skirt length measurement is obtained by measuring from the natural waistline at the left side of the body to the location where the lower edge of the garment ends.

Other measurements may be required in order to custom sew specific types of garments. For example, two crotch measurements may be needed to construct a pair of women's slacks. The ***crotch depth*** measurement is obtained by having the client sit on a hard, flat chair and measuring from the natural side waistline to the chair seat. This measurement is also known as the ***rise***. The ***crotch length measurement*** is obtained by measuring from the center front waistline, under the crotch (between legs) to the center back waistline. When a dress is constructed, the back dress length measurement is needed. The ***back dress length*** measurement is obtained by adding the center back skirt length measurement to the center back bodice length measurement.

Measuring Men and Boys

Men and boys should wear undershirts and lightweight pants when being measured. The client should not wear a belt. Before selecting men's or boy's patterns, the basic measurements included in the following list should be taken:

- ***height*** - As when measuring females, height is measured while the client wears no shoes and stands with his back against a wall. A ruler is placed on top of the head and a mark is made where the ruler touches the wall. The person measuring then measures from the floor to the mark.
- ***neck circumference*** or ***neckband*** - The neck circumference or neckband measurement is taken around the fullest part of the neck at the Adam's apple.

- ***chest*** - The chest measurement is obtained by measuring around the fullest part of the chest and back.
- ***waist*** - The waist measurement is obtained by measuring around the body where the waistline seam on the pants rests. The pants should be adjusted to the position the client prefers and the tape measure should be parallel to the floor.
- ***hips*** - The hips measurement is taken by measuring at the fullest part of the hips. The person measuring should record the distance from the natural waistline that the hip measurement is taken.
- ***shirt sleeve length*** - The shirt sleeve length measurement is obtained by measuring from the base of the neck at the center back, across the shoulder to the elbow, and over the slightly bent arm to the wrist.

Besides these basic measurements, the following additional measurements may be taken in order to achieve a good fit when altering men's and boys' patterns:

- ***back neck to waist*** or ***back waist length*** - As when measuring females, the back neck to waist, or back waist length measurement, is taken by measuring from the client's prominent neck bone to the natural waistline at the center back.
- ***shoulder length*** - As when measuring females, the shoulder length measurement is taken by measuring from the base of the neck to the top of the arm (tip of the shoulder). The base of the neck can be located by shrugging the shoulders. The top of the arm can be located by raising the arm as high as the shoulder to find the joint.
- ***arm length*** - As when measuring females, the arm length measurement is secured by measuring from the top of the arm (at the shoulder bone) over a slightly bent elbow to the wrist bone.
- ***trouser inseam*** - The trouser inseam measurement is secured by measuring from the crotch of the pants down the inside of the leg to the desired pants length.
- ***trouser outseam*** or ***trouser length*** - The trouser outseam or trouser length measurement is secured by measuring from the pants waistline seam down the side seam to the desired pants length.
- ***crotch length*** - The crotch length measurement is taken when the client is seated on a hard, flat chair by measuring from the waistline seam at the side down to the chair seat.
- ***crotch depth*** - The crotch depth measurement is taken when the client is seated, measuring from the natural waistline to the chair seat.

Measuring Children

Children should be measured wearing undergarments only. Children's measurements should be checked often since they grow quickly and measurements change. Patterns for children are grouped into several types. When a child's measurements fall between two pattern sizes, it is usually best to select the larger size. To select patterns for toddlers, children, and girls, the following basic measurements should be taken:

- ***weight*** - Weight should be calculated when selecting patterns for infants.
- ***height*** - Height is calculated using the same method that is used to measure women and men.

- ***breast*** - The breast measurement is taken by measuring under the arms over the fullest part of the chest in front and just under the shoulder blades in the back.
- ***waist*** or ***waistline*** - The waist or waistline measurement is taken using the same method that is used to measure women.
- ***hips*** - The hips measurement is taken by measuring around the body at the fullest part of the hips.
- ***back waist length*** - The back waist length measurement is obtained by measuring from the prominent bone at the base of the neck to the waist.
- ***finished dress length*** - the finished dress

length measurement is taken by adding the back waist length measurement to the center back skirt length measurement.

In addition to the previously described measurements, the following measurements may be required in order to alter patterns for children:

- ***arm length*** - The arm length measurement is obtained by measuring from the top of the arm over the bent elbow to the wrist.
- ***shoulder length*** - The shoulder length measurement is taken by measuring from the base of the shoulder to the prominent bone at the outer edge of the shoulder.
- ***crotch depth*** - The crotch depth measurement is taken by having the child sit on a firm chair with feet flat on the floor and measuring from the natural side waistline to the chair seat.
- ***pants inseam*** - The pants inseam measurement is taken by the same method that is used to obtain the trouser inseam measurement for men.
- ***pants outseam*** - The pants outseam measurement is taken by the same method that is used to obtain the trouser outseam measurement for men.

◆ Essential Questions: ◆ Measuring the Human Figure

1. What are the general procedures to follow when measuring a client?
2. What basic measurements are most often used when selecting patterns for females?
3. What basic measurements are most often used when selecting patterns for males?
4. What basic measurements are most often used when selecting patterns for children?

DETERMINING FIGURE TYPE

To assist clients in purchasing correct pattern sizes, patterns are grouped according to height, proportion, and shape. These groups of patterns are called figure types. The following basic figure types are used when selecting patterns for females: Misses', Miss Petite, Junior, Junior Petite, Young Junior/Teen, Half-Size, and Women's. The various figure types for females are illustrated in figure 16.2. Table 16.1 provides descriptions of these female figure types. For example, by reviewing the table one can determine that Misses' patterns are designed for females who are approximately 5 feet 5 inches to 5 feet 6 inches in height, well developed, and well proportioned. These females are taller and have longer back neck to waist measurements than all other female figure types except for Women's. The hip measurement is measured at 9 inches below the natural waistline. The Misses' figure type is considered to be the average female figure.

Patterns are selected for males using the following figure types: Boys', Teen-Boys', and Men's. Figure types for males are shown in figure 16.3. Table 16.2 provides descriptions of the three male figure types. For example, Men's figure type patterns are designed for males with a mature build and an average height of 5 feet 10 inches.

Patterns for children's clothing are grouped into the following categories to reflect styles and physical development of the average child at specific ages: Babies, Toddlers', Children's, Girls', and Chubbie. Figure types for children are illustrated in figure 16.4. Table 16.3 provides descriptions of the figure types for children. For example, Babies patterns are for infants who do not yet walk. Styles are usually appropriate for both boys and girls.

The names assigned to different figure types are not intended to indicate that pattern size should be selected according to the age

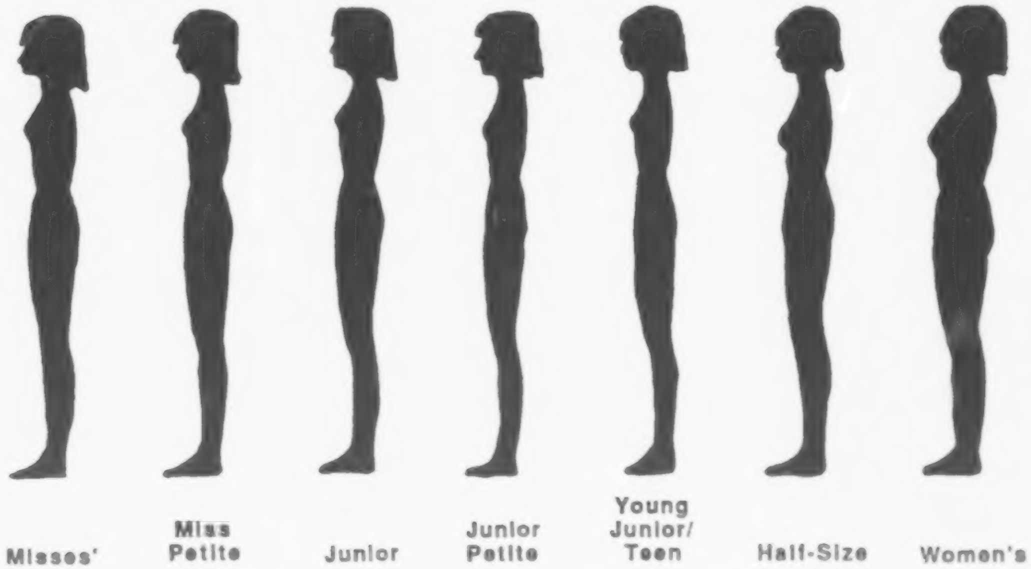


Figure 16.2

Female Figure Types	
Figure Types	**Descriptions**
Misses'	Approximately 5'5" tall; well developed; well proportioned; taller than other figure types except Women's; longer back waist length than other figure types except Women's; hips are measured 9" below waistline; considered the average figure type.
Miss Petite	Approximately 5'2" to 5'4" tall; proportions similar to Misses'; shorter overall than Misses'; narrower shoulder measurement than Misses'; hips are measured 7" below waist.
Junior	Approximately 5'4" tall; well developed; shorter back waist length and higher bustline than Misses'; hips are measured 9" below waistline.
Junior Petite	Approximately 5' to 5'1" tall; fully developed figure; shorter than Junior; similar proportions to Junior; hips are measured 7" below waistline.
Young Junior/ Teen	Approximately 5'4" tall; well developed; shorter back waist length and higher bustline than Misses'; hips are measured 9" below waistline.
Half-Size	Approximately 5'2" to 5'3" tall; larger waist, shorter back waist length, and narrower shoulder than Misses'; hips are measured 7" below waistline.
Women's	Approximately 5'5" to 5'6" tall; larger figure overall than Misses'; similar to Misses' in height and proportions; hips are measured 9" below waistline.

Table 16.1

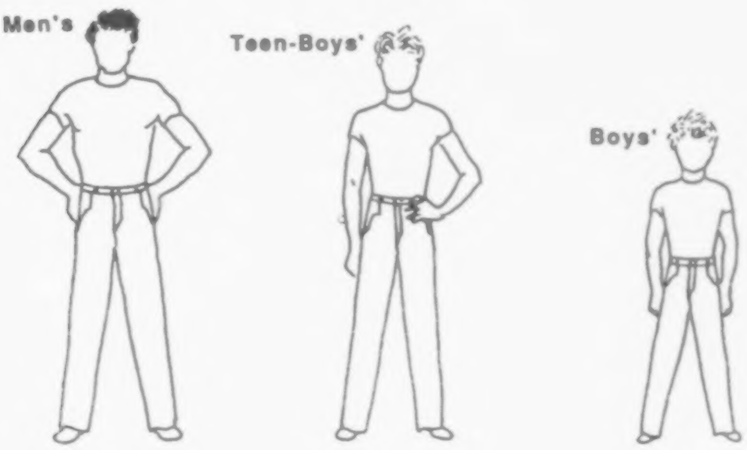


Figure 16.3

Male Figure Types

Figure Types	Descriptions
Men's	For males with mature body build; average height of 5'10".
Teen-Boys'	For males who have not developed adult proportions.
Boys'	For young males who are growing.

Table 16.2

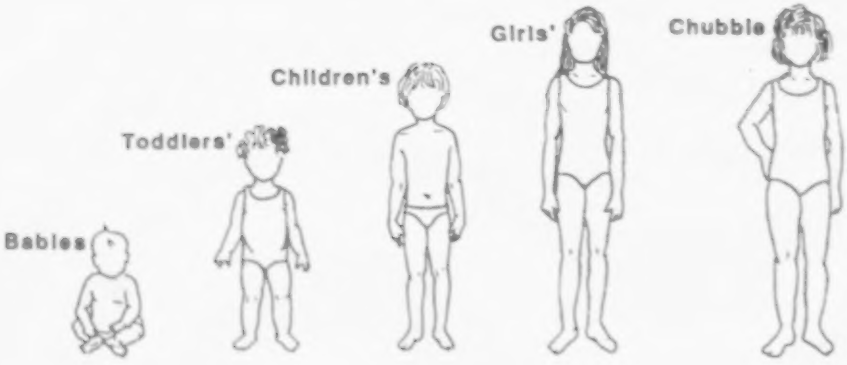


Figure 16.4

Children's Figure Types	
Figure Types	**Descriptions**
Babies	For infants who are not walking; ease is allowed for diapers; styles are usually appropriate for boys and girls.
Toddlers'	For toddlers who are between babyhood and childhood; ease is allowed for diapers; styles are usually appropriate for boys and girls.
Children's	Same breast and waist measurements as Toddlers'; height is taller than Toddlers'; shoulder, arm, and dress lengths are longer than Toddlers'.
Girls'	For figures that have not begun to mature; similar to Boys' sizes; height is taller than Boys'.
Chubbie	For growing girls; weight is above average for age and height; height is about the same as for Girls'.

Table 16.3

of the client. Each person's body matures and grows at an individual rate. It is possible that a male teenager may find Men's sizes more comfortable to wear than Teen-Boys' sizes. A female teenager may find that Misses' sizes fit more comfortably than Young Junior/Teen sizes.

◆ *Essential Questions:* ◆
Determining Figure Type

1. What various characteristics are considered in determining female figure types?
2. What are the three figure types used in patterns for males? What characteristics are considered in determining the male figure types?
3. What are the five children's figure types? What characteristics are considered in determining children's figure types?

SELECTING PATTERN SIZE

In 1968, patterns were standardized so patterns from various pattern companies are based on the same measurements. Pattern companies have developed size range charts like those shown in table 16.4, table 16.5, and table 16.6. Once a client's figure type has been identified, the custom sewer is able to use the appropriate size range chart and the client's personal measurements to select the best pattern size.

When selecting a pattern size, it is important to remember that major pattern companies follow the same set of body measurements for bust, waist, hip, and back neck to waist. However, patterns from different companies usually differ in shoulder width slant, shape of the armhole and neckline, and slant of the underarm. The amount of ease added to patterns may also differ with patterns made by different pattern companies. Because of these variations in pattern shape and seam allowance, one pattern brand may fit a particular client better than others.

Once the client's figure type has been identified, it is important to identify the client's pattern size within that figure type. The first step in selecting pattern size is to compare the client's bust/chest, waist, and hip measurements with those listed on the chart on the back of the pattern envelope. The measurements on the pattern envelope that are closest to the client's measurements indicate the correct pattern size. Refer to figure 16.6 for an example of the information found on the back of the pattern envelope.

Few people have measurements that exactly match the measurements on the back of a pattern envelope. If a client's measurements fall between two pattern sizes, it is usually best to select the smaller size if the design of the garment is full or loose fitting. It is usually best to select the larger size if the design of the garment is closely fitted. As a result of the differences between the client's measurements and the pattern measurements, alterations must be done by the custom sewer.

Assisting Clients

When a client brings pattern, fabric, and notions to be made into a garment, the custom sewer should use the following guidelines:

- Verify that the pattern is the correct figure type and size for the client. Refer to the client's personal measurement chart. Recheck the client's measurements if needed. Compare the client's measurements to the measurements on the pattern envelope.
- Identify the pattern view the client prefers and circle the selected view on the pattern envelope.
- Determine if the fabric is suitable for the garment design.
- Decide if enough fabric yardage was purchased to make the selected pattern view. Check the yardage required for width of fabric and fabric nap, if any, for the view desired. Consider if enough yardage was purchased to allow for alterations and matching fabric patterns.
- Confirm that the client purchased additional items needed such as interfacing, lining, underlining, or trim.
- Confirm that the client purchased notions in the needed quantities.
- Confirm that all pattern pieces needed to construct the garment are enclosed in the pattern envelope along with the instruction sheets.

Using the Pattern Envelope

A variety of information needed by the custom sewer can be found on the pattern envelope. The following information is found on the front of the pattern envelope:

- pattern brand
- pattern number
- price
- fashion illustration(s) of the views (styles)
- pattern category of special features (such as knits only, easy to sew, or designer)
- figure type and size
- bust or chest measurement

Figure 16.5 shows information found on the front of a pattern envelope.

The following additional information may be found on the back of the pattern envelope:

- garment description
- fabric and design suitability
- number of pattern pieces
- body measurements
- yardage chart
- suggested fabrics
- information regarding the need for additional yardage for nap
- garment dimensions (finished length and bottom circumference)
- notions required
- line drawings of different views (back and front)
- company name and address

As noted previously, information found on the back of a pattern envelope is included in figure 16.6. Measurements are often provided on pattern envelopes in both U.S. standard units and metric units. Although U.S. standard units are most frequently used by most home sewers, metric units are frequently used in the textile and apparel industries.

◆ Essential Questions: ◆ Selecting Pattern Size

1. Why may one pattern brand fit a client better than other pattern brands?
2. If a client's measurements fall between two pattern sizes, which pattern size should be selected? Why?
3. What types of information can be found on the front of the pattern envelope?
4. What types of information can be found on the back of the pattern envelope?

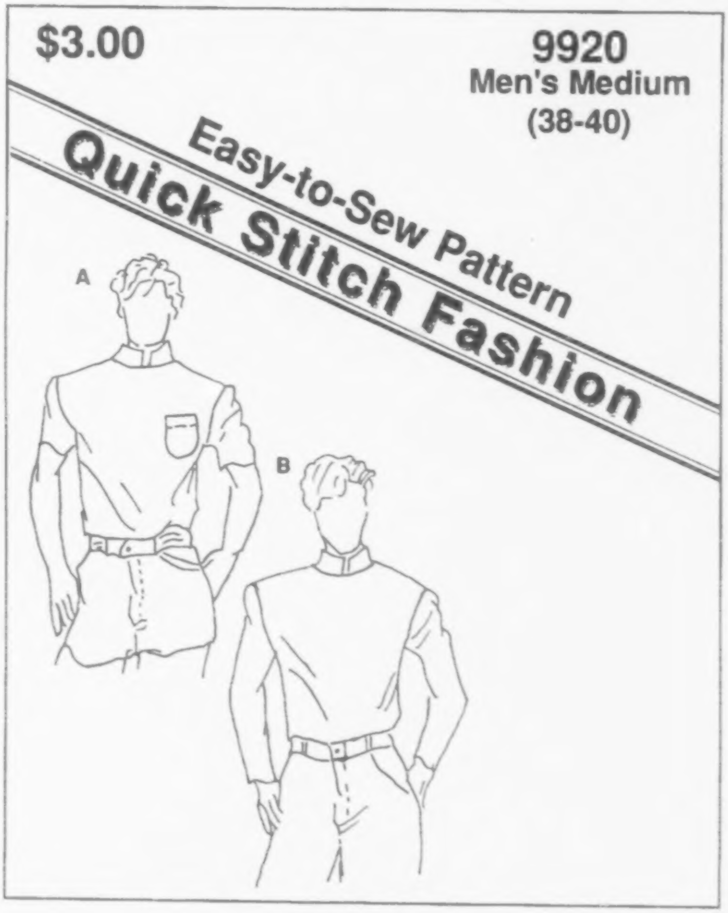


Figure 16.5

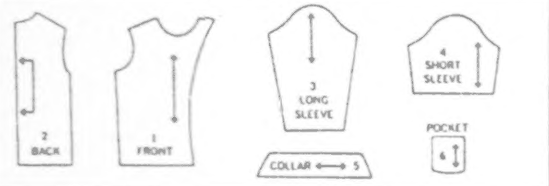
9920 Men's Shirt

Collared shirt has set-in sleeves. View A has short sleeves. View B has long sleeves.

BODY MEASUREMENTS	Small	Medium	Large	Extra Large
Neck	14-14 1/2	15-15 1/2	16-16 1/2	17-17 1/2 Ins.
Chest	34-36	38-40	42-44	46-48 "
Waist	28-30	32-34	36-39	42-44 "
Hip	35-37	39-41	43-45	47-49 "
VIEW A				
35"-36" with nap	2 3/8	2 3/8	3 1/4	3 3/8 Yds.
44"-45" with nap	1 7/8	1 7/8	2 1/4	2 3/8 "
58"-60" with nap	7/8	7/8	1 1/4	1 1/4 "
VIEW B				
35"-36" with nap	2 7/8	3 1/4	3 5/8	4 Yds.
44"-45" with nap	2 1/2	2 1/2	2 7/8	3 "
58"-60" with nap	1 7/8	1 7/8	2 1/8	2 3/8 "
Interfacing for collar				
35"-36"	1/4	1/4	1/4	1/4 Yd.
44"-45" woven	1/4	1/4	1/4	1/4 "
Finished back length	30	30 1/2	31	31 1/2 Ins.

FABRICS: Cotton, broadcloth, denim, double knit, seersucker, corduroy, madras, gingham.

NOTIONS: Thread, seam tape



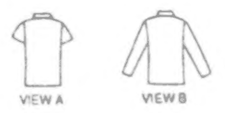


Figure 16.6

Size Range Charts – Female Figure Types

Misses'

Size	6	8	10	12	14	16	18	20
Bust	30½	31½	32½	34	36	38	40	42
Waist	23	24	25	26½	28	30	32	34
Hip	32½	33½	34½	36	38	40	42	44
Back waist length	15½	15¾	16	16¼	16½	16¾	17	17¼

Miss Petite

Size	6mp	8mp	10mp	12mp	14mp	16mp
Bust	30½	31½	32½	34	36	38
Waist	23½	24½	25½	27	28½	30½
Hip	32½	33½	34½	36	38	40
Back waist length	14½	14¾	15	15¼	15½	15¾

Junior

Size	5	7	9	11	13	15
Bust	30	31	32	33½	35	37
Waist	22½	23½	24½	25½	27	29
Hip	32	33	34	35½	37	39
Back waist length	15	15¼	15½	15¾	16	16¼

Junior Petite

Size	3JP	5JP	7JP	9JP	11JP	13JP
Bust	30½	31	32	33	34	35
Waist	22½	23	24	25	26	27
Hip	31½	32	33	34	35	36
Back waist length	14	14¼	14½	14¾	15	15¼

Young Junior/Teen

Size	5/6	7/8	9/10	11/12	13/14	15/16
Bust	28	29	30½	32	33½	35
Waist	22	23	24	25	26	27
Hip	31	32	33½	35	36½	38
Back waist length	13½	14	14½	15	15⅜	15¾

Half-Size

Size	10½	12½	14½	16½	18½	20½	22½	24½
Bust	33	35	37	39	41	43	45	47
Waist	27	29	31	33	35	37½	40	42½
Hip	35	37	39	41	43	45½	48	50½
Back waist length	15	15¼	15½	15¾	15⅞	16	16⅛	16¼

Women's	38	40	42	44	46	48	50
Bust	42	44	46	48	50	52	54
Waist	35	37	39	41½	44	46½	49
Hip	44	46	48	50	52	54	56
Back waist length	17¼	17⅜	17½	17⅝	17¾	17⅞	18

Table 16.4

Size Range Charts – Male Figure Types

Boys'					Teen-Boys'			
Size	7	8	10	12	14	16	18	20
Chest	26	27	28	30	32	33½	35	36½
Waist	23	24	25	26	27	28	29	30
Hip (seat)	27	28	29½	31	32½	34	35½	37
Neck circumference	11¾	12	12½	13	13½	14	14½	15
Height	48	50	54	58	61	64	66	68

Men's

Size	34	36	38	40	42	44	46	48
Chest	34	36	38	40	42	44	46	48
Waist	28	30	32	34	36	39	42	44
Hip (seat)	35	37	39	41	43	45	47	49
Neck circumference	14	14½	15	15½	16	16½	17	17½
Shirt sleeve	32	32	33	33	34	34	35	35

Table 16.5

Size Range Charts – Children's Patterns

Babies

Age	**Newborn (1-3 months)**	**6 months**
Weight	7–13 lbs.	13-18 lbs.
Height	17"–24"	24"–26½"

Toddlers'

Size	¼	1	2	3	4
Breast or chest	19	20	21	22	23
Waist	19	19½	20	20½	21
Approximate height	28"	31"	34"	37"	40"
Finished dress length	14"	15"	16"	17"	18"

Children's

Size	1	2	3	4	5	6	6X
Breast or chest	20	21	22	23	24	25	25½
Waist	19½	20	20½	21	21½	22	22½
Hip				24	25	26	26½
Back waist length	8¼	8½	9	9½	10	10½	10¾
Approximate height	31"	34"	37"	40"	43"	46"	48"
Finished dress length	17"	18"	19"	20"	22"	24"	25"

Girls'

Size	7	8	10	12	14
Breast	26	21	28½	30	32
Waist	23	23½	24½	25½	26½
Hip	27	28	30	32	34
Back waist length	11½	12	12¾	13½	14¼
Approximate height	50"	52"	56"	58½"	61"

Chubbie

Size	8½c	10½c	12½c	14½c
Breast	30	31½	33	34½
Waist	28	29	30	31
Hip	33	34½	36	37½
Back waist length	12½	13¼	14	14¾
Approximate height	52"	56"	58½"	61"

Table 16.6

Chapter Highlights

- ☆ The success of a finished custom-made garment depends on the selection of a pattern in the correct figure type and size.

- ☆ Factors to be considered before a commercial pattern is selected include the purpose of the garment, influence on current fashion, influence of the elements and principles of design, kind of fabric, figure type, and pattern size.

- ☆ Taking measurements is a major factor in saving time during garment construction. Accurate measuring is important and can only be done if concentration and patience are used throughout the measuring process.

- ☆ Good measuring tools are essential for achieving accurate fit in custom clothing, alterations, or in apparel manufacturing. The key to sewing success is to measure often and accurately in addition to rechecking measurements.

(Continued on page 278)

Chapter Highlights

(Continued from page 277)

- There are specific procedures to follow in measuring the human figure in order to make decisions regarding custom garments. When aligning the tape measure around the body, it should feel snug, but not tight. Measurements are more exact when taken by a person other than the individual being measured.

- A variety of measurements may be taken when choosing a commercial pattern, altering a pattern, or designing a pattern. When choosing a commercial pattern, the selection is usually based on only a few measurements. Additional measurements may be needed for pattern alteration.

- The basic measurements needed in order to select a pattern for a female client are height, back waist length, high bust, bust, waist, and full hip.

- The basic measurements needed in order to select a pattern for a male client are height, neck circumference, chest, waist, hips, and shirt sleeve length.

- Children's measurements should be checked often since they grow quickly and measurements change. When a child's measurements fall between two pattern sizes, it is usually best to select the larger size.

- To assist customers in purchasing correct pattern sizes, patterns are grouped according to height, proportion, and shape. These groups of patterns are called figure types.

- The following basic figure types are used when selecting patterns for females: Misses', Miss Petite, Junior, Junior Petite, Young Junior/Teen, Half-Size, and Women's.

- Patterns are selected for males using the following figure types: Boys', Teen-Boys', and Men's.

- Patterns for children's clothing are grouped into the following categories to reflect styles and physical development of the average child at specific ages: Babies, Toddlers', Children's, Girls', and Chubbie.

- The names assigned to figure types are not intended to indicate that pattern size should be selected according to the age of the client.

- When selecting a pattern size, it is important to remember that major pattern companies follow the same set of body measurements for bust, waist, hip, and back neck to waist. However, patterns from different companies may differ in other measurements.

- A variety of information needed by the custom sewer can be found on the pattern envelope.

Chapter 17

Pattern Alteration Procedures

Chapter Focus

The following Essential Knowledge and Skills are discussed in this chapter:

6A Demonstrate correct procedures utilized in garment fitting and alteration.
6B Describe characteristics of proper fit in garments.
6C Determine alterations to solve common fitting problems resulting from individual differences and special needs.
6E Apply elements and principles of design in altering, repairing, and customizing textile and apparel products.
6F Utilize appropriate techniques and processes to alter, repair, and customize textile and apparel products according to quality standards.

Chapter Vocabulary

body bulges
circumference seams
construction lines
crosswise grain
design ease
grain
grosgrain ribbon method
lengthwise grain
pattern alteration
set
silhouette seams
wearing ease

Pattern alteration is changing a pattern in order to achieve proper fit and appearance. It is important for employees to understand pattern alteration techniques. Custom sewers, pattern makers, and designers should understand how pattern alterations are performed in order to construct garments that fit properly. Alteration procedures involving lengthening and shortening are basically the same for different types of garments. For example, the same basic procedures would be followed when altering length of patterns for pants, slacks, skirts, and bodices. Techniques for adding or subtracting width are also similar for different types of garments. Once basic alteration techniques are learned, garments with accurate fit can be produced.

CHARACTERISTICS OF A WELL-FITTED GARMENT

It is important for an employee to understand how and why a garment fits well. Unless a garment is properly fitted, it will not look professionally constructed. Proper fit can be achieved by altering the pattern, while minor fitting adjustments can be made after a garment is constructed. Employees must be able to recognize fitting problems and apply appropriate alterations to solve those problems.

A well-fitted garment includes grain, balance, ease, set, and line. A properly fitted garment has adequate ease that is properly distributed, has lines that follow the lines and curves of the body, is on grain, has a smooth set, and is balanced on the body. These factors are related to and dependent upon each other. For example, if a garment is off-grain, the balance and set will not be accurate. Many times, one problem area is easier to identify than others. Sometimes when one problem is identified and corrected, other undesirable characteristics are corrected as a result.

Grain

Grain refers to the lengthwise and crosswise direction of yarns in a fabric. The yarns that are horizontal across the body indicate the ***crosswise grain***. The yarns that are vertical on a garment indicate the ***lengthwise grain***.

When a garment is fitted correctly, the lengthwise grain is perpendicular to the floor at the center front and center back of the garment. The crosswise grain is parallel to the floor at the center front and center back on the bust line and hip line.

Grain is very important in recognizing improper fit in a garment. The grain on the right half of the body should match the grain on the left half of the body. Garments do not have actual grain lines marked on them except when a striped or plaid fabric is used. An employee can easily recognize off-grain areas by examining the way the garment hangs or sets on the body.

Balance

A garment shows proper balance when it hangs the same distance from the body from right to left and front to back. Proper balance is achieved when a garment is on-grain and has sufficient ease. For example, a large body bulge causes a garment to be unbalanced and causes the crosswise grain to curve instead of hang straight. Employees should remember that figure types of clients will vary. Therefore, it is important to have the ability to recognize custom fit when constructing garments for an individual.

Ease

As discussed in Chapter Sixteen, ease is the difference between the body measurement and the garment measurement at a given point. When a garment has the correct amount of ease, it is neither too loose nor too tight. Ease in a garment provides comfort without producing wrinkles or bulkiness and allows for easy movement. Ease also allows a garment to adjust naturally to the movements of the wearer.

There are two types of ease. ***Wearing ease*** is the amount of fullness needed in a garment for movement and comfort. ***Design ease*** is the designed-in fullness that causes some garments to measure considerably larger than the body either overall or in particular areas. Design ease is used to create a particular style or silhouette.

The exact amount of ease required in a particular garment is determined by factors such as current fashion, body build, activity, and fabric type. Minimum amounts of ease have been established as guidelines to observe when fitting. However, these standards often vary among different styles and designers. Average ease amounts are included on the personal measurement chart in Chapter Sixteen.

In order to evenly distribute ease, it must be added to all four quarters of the garment. Each major pattern piece represents 1/4 of the client's body. The total amount of ease required is divided by four to find the amount needed in each quarter of the pattern. For example, if 2 inches of ease are needed, 1/2 inch of ease should be allowed in each quarter of the garment. When checking a garment for the correct amounts of ease, it is important to pin tucks into the garment when fitting. Since a tuck has two thicknesses, it removes twice the amount of its width. Therefore, the width of the tuck should be half the amount of ease needed.

Set

Set refers to the way a garment fits or hangs on the body. When a garment fits properly, it sets smoothly over body bulges without wrinkling, bulging, sagging, or straining. Although the body is made up of many different kinds of curves, there are seven basic curves referred to as **body bulges**. The seven body bulges that must be considered when fitting a garment are the bust, end of shoulder, shoulder blade, elbow, abdomen, side hip, and back hip.

Wrinkles are produced when a garment is strained over a curve or bulge. Diagonal or slantwise wrinkles usually point to the body bulge causing the strain. Crosswise or horizontal wrinkles usually occur when a garment is too tight or too long. Vertical folds appear when there is too much width in a garment. Proper set can usually be achieved by adjusting seam allowances.

Line

As discussed in Chapter Seven, line is one of the elements of design. Line indicates direction, length, width, and straightness. Garment lines may be decorative or structural. Structural lines are sometimes called **construction lines**. Construction lines include basic lines such as yokes, seam lines, pockets, necklines, and pleats.

Construction lines can be vertical, horizontal, or diagonal. Diagonal and vertical lines usually cause a figure to appear taller while horizontal lines usually cause a figure to appear wider and shorter. However, diagonal and vertical lines can sometimes cause a figure to appear shorter, and horizontal lines can cause a figure to appear taller. Therefore, employees should be skilled in the use of line in order to achieve desired effects. Table 17.1 describes various construction lines.

Silhouette seams are examples of construction lines. **Silhouette seams** help determine the silhouette or outline of a garment. These seams include the shoulder seam and all side seams. Silhouette seams should appear halfway between the front and back of the figure. When a garment is viewed from the side, silhouette seams, except the shoulder seam, should be perpendicular to the floor.

Circumference seams are also examples of construction lines. **Circumference seams** are smooth seams that follow the natural curves of the body. Circumference seams encircle the body at the neckline, armhole, waistline, and hemline. Each circumference seam has specific requirements for proper fit.

Construction Lines	
Type	**Description**
Armseye Seam	The ***armseye seam*** is a circumference seam that is created when a set-in sleeve is attached to the armhole of a bodice. The top of the armseye seam lies on the prominent bone at the edge of the shoulder. From the front, the armseye seam should appear to be straight from the shoulder tip to the point at which it disappears under the arm. The armseye seam should be perpendicular to the floor from the top of the shoulder to the point where it begins to curve under the arm.
Center Back Seam	The ***center back seam*** is located along the center of the vertebrae. It is straight and perpendicular to the floor. The center back seam visually divides the figure into two halves.
Center Front Seam	The ***center front seam*** is straight and points to the hollow of the throat. It is perpendicular to the floor and visually divides the figure into two halves.
Darts and Tucks	Darts and tucks release their fullness at the fullest point of the body contour. Darts and tucks are spaced to form pleasing proportions with other construction lines.
Neckline Seam	The ***neckline seam*** fits the curve at the base of the neck. It should touch the hollow of the throat in front, intersect the neck and shoulder, and touch the most prominent vertebrae at the back of the neck. The neckline seam should appear to rest comfortably at the base of the neck.
Shoulder Seam	The ***shoulder seam*** extends from the neck, beneath the back of the ear lobe, to the bone at the top of the shoulder. The shoulder seam should not be seen from the front or back. It should be well-balanced between the front and back when viewed from the side.
Side Seam	The ***side seam*** forms a straight line that is perpendicular to the floor. It is visually balanced in the front and the back when viewed from the side. A side seam should be inconspicuous when viewed from the front or back.
Waistline Seam	The ***waistline seam*** is the line on the torso that creases when the torso is bent. The waistline seam should be parallel to the floor when viewed from the side. It should also fit snugly but not too tight.

Table 17.1

◆ Essential Questions: Characteristics of a Well-fitted Garment ◆

1. Why is it easier to achieve proper fit by altering a pattern before a garment is constructed?
2. Why is it important for a garment to be on-grain?
3. When does a garment show proper balance? How can balance be achieved?
4. What is the difference between wearing ease and design ease?
5. What are signs that a garment is properly set? improperly set?
6. How should silhouette lines look on a well-fitted garment? How should circumference seams look?

PATTERN SELECTION

Since they are made to be purchased by many customers, patterns are designed and sized to fit average figures. Many figures, however, are not average. A pattern may fit a client well in some areas while it may not fit well in other areas. It is important for an employee to be able to identify the areas where a pattern needs adjusting. The fit of a finished garment depends on the adjustments that are made to the pattern before the garment is actually constructed.

To avoid making unnecessary pattern alterations, employees should attempt to assist clients in making wise pattern choices. Factors that should be considered when selecting a pattern include the following:

- purpose of the garment
- current fashion trends
- elements and principles of design
- type of fabric to be used
- figure type and pattern size
- sewing ability of the person who will construct the garment

Although these decisions are usually made by the client, employees should be prepared to answer questions and make suggestions when appropriate.

As discussed in Chapter Sixteen, it is important for a client to have her or his exact measurements available when choosing a pattern. Garments that fit properly rely on accurate measurements. Measurements of adults should be checked periodically and recorded on a personal measurement chart to ensure a custom fit. Measurements for children should be taken each time a pattern is purchased. Chapter Sixteen also includes information on the tools used when measuring the human figure.

To determine correct pattern size, the employee should compare the measurements recorded on the client's personal measurement chart with the body measurements listed on the pattern envelope. Major pattern companies follow the same set of body measurements for bust, waist, hip, and back waist length. However, patterns from different companies can differ in shoulder width slant, shape of armseye and neckline, and slant of the underarm. The amount of ease can differ also. Because of these variations in pattern shape and seam allowance, certain brands of patterns may fit a client better than other brands. Once a pattern is selected in the proper figure type and size, preparations for altering the pattern may be made.

◆ Essential Questions: ◆
Pattern Selection

1. How can unnecessary pattern alterations be avoided?
2. What factors should be considered when selecting a pattern?
3. How is correct pattern size determined? Why is it important that the client's measurements be accurate?

PATTERN ALTERATION

Before a garment is cut out, the fit of the pattern should be checked. Usually, only simple adjustments to the pattern are necessary. Adjusting the pattern before a garment is cut out reduces the need for major alterations after a garment is constructed. When performing basic pattern alterations, the following steps should be completed:

- Take the client's measurements.
- Compare the client's measurements with the measurements on the pattern.
- Perform the required alterations.

Measuring Clients

To determine if the pattern chosen will require any alterations, the employee must first measure the client. Additional measurements are required when altering a pattern than when choosing a pattern since each body measurement is compared with the corresponding measurement on the pattern pieces.

During the measuring process, female clients should wear smooth undergarments that are normally worn. If desired, the client may wear a closefitting garment such as a body suit or leotard over undergarments. In addition to the basic measurements used when selecting patterns, the following measurements should be taken in order to achieve a good fit when altering women's patterns:

- 3 inches below waist
- 7 inches below waist
- 9 inches below waist
- shoulder length
- upper back width
- 5 inches below neck back width
- center front bodice length
- shoulder to bust point bodice length
- bust point to waist bodice length
- center back bodice length
- over the shoulder blade bodice length
- shoulder to elbow
- shoulder to wrist or arm length
- girth
- wrist
- center front skirt length
- right side skirt length
- center back skirt length
- left side skirt length
- crotch length
- crotch depth
- back dress length

Men and boys should wear undershirts and lightweight pants when being measured. In addition to the basic measurements used when selecting patterns, the following measurements should be taken in order to achieve a good fit when altering men's and boys' patterns:

- back neck to waist length
- shoulder length
- arm length
- trouser inseam
- trouser outseam
- crotch length
- crotch depth

Children should be measured wearing undergarments only. In addition to the basic measurements used when selecting children's patterns, the following measurements may be required in order to alter patterns for children:

- arm length
- shoulder length
- crotch depth
- pants inseam
- pants outseam

Detailed procedures for measuring women, men and boys, and children are included in Chapter Sixteen.

Comparing Measurements

To decide when and where pattern alterations are needed, an employee must compare the client's figure measurements with the corresponding measurements on the actual pattern. Some of the actual pattern pieces will be measured while other measurements will be compared with the measurements appearing on the pattern envelope.

The client's measurements are not intended to exactly match those of the pattern. Garments do not and should not fit as closely as the tape measure. Room is needed in garments to sit, walk, reach, and bend. As discussed previously, this is known as wearing ease. Wearing ease is included in patterns and should be included when a pattern is altered.

When altering a pattern, the employee should make sure the pattern measures more than the figure measurements of the client. However, not all patterns require the standard amount of wearing ease. Patterns deigned for stretchy knit garments or strapless garments require less wearing ease. Average ease amounts to include when altering patterns are listed on the personal measurement chart in Chapter Sixteen.

The client's bust, waist, hip, and back waist length measurements should be compared with the measurements given on the pattern envelope (without any allowance for wearing ease). Other measurements should be compared with the measurements of the actual pattern pieces. Procedures for comparing the client's measurements with the measurements of the pattern pieces are included in figure 17.1. Pattern pieces that measure a significant amount more or less than the client's measurements will need to be altered. Once the employee decides which pieces will be altered, basic pattern alterations can be made.

Performing Basic Pattern Alterations

When several pattern alterations will be made, length alterations should be completed first. It is important to make length alterations first so that width alterations will be made at the correct place on the pattern. Length alterations should be completed in the following order:

- above the waist
- below the waist or overall length
- at the sleeve

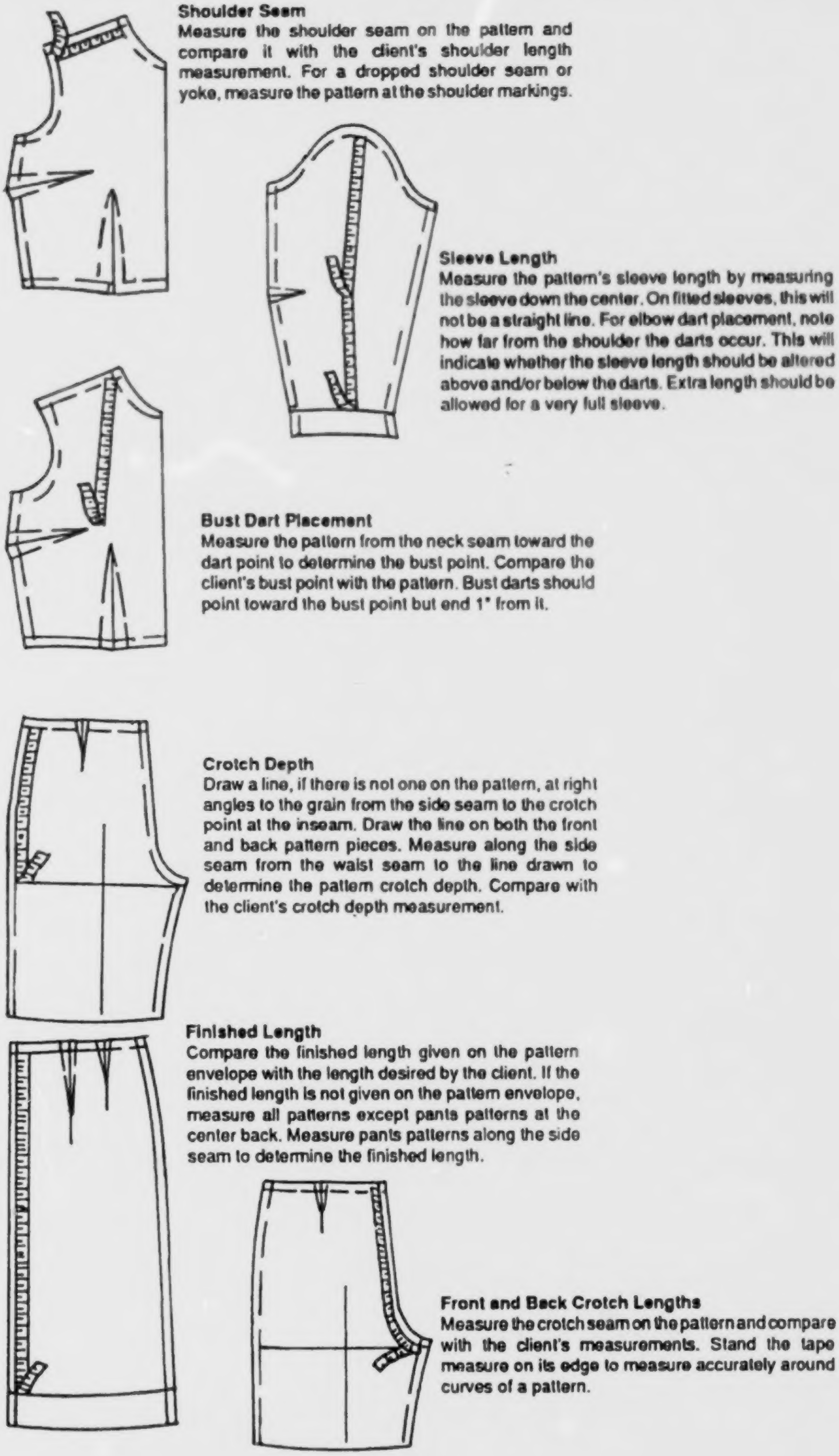
Once length alterations are completed, dart placement should be altered. When darts are pointing in the proper direction and are the correct length, width adjustments are made. Width adjustments should be completed in the following order:

- at the bust
- at the waist
- at the hip

Additional specialized alterations are completed after all basic length and width changes have been made.

To ensure accuracy when completing pattern alterations, the following guidelines should be observed:

- Press the pattern pieces with a warm, dry iron to remove wrinkles before making any alterations.
- Pin the alterations in first, measure them for accuracy, and then tape the changes in place.
- Cut the pattern piece apart at the appropriate point and spread the cut pieces the appropriate amount to add length or width. Tape the cut pieces to a piece of tissue paper.
- Cut the pattern piece apart at the appropriate point and lap or fold the cut pieces the appropriate amount to decrease length or



Shoulder Seam
Measure the shoulder seam on the pattern and compare it with the client's shoulder length measurement. For a dropped shoulder seam or yoke, measure the pattern at the shoulder markings.

Sleeve Length
Measure the pattern's sleeve length by measuring the sleeve down the center. On fitted sleeves, this will not be a straight line. For elbow dart placement, note how far from the shoulder the darts occur. This will indicate whether the sleeve length should be altered above and/or below the darts. Extra length should be allowed for a very full sleeve.

Bust Dart Placement
Measure the pattern from the neck seam toward the dart point to determine the bust point. Compare the client's bust point with the pattern. Bust darts should point toward the bust point but end 1" from it.

Crotch Depth
Draw a line, if there is not one on the pattern, at right angles to the grain from the side seam to the crotch point at the inseam. Draw the line on both the front and back pattern pieces. Measure along the side seam from the waist seam to the line drawn to determine the pattern crotch depth. Compare with the client's crotch depth measurement.

Finished Length
Compare the finished length given on the pattern envelope with the length desired by the client. If the finished length is not given on the pattern envelope, measure all patterns except pants patterns at the center back. Measure pants patterns along the side seam to determine the finished length.

Front and Back Crotch Lengths
Measure the crotch seam on the pattern and compare with the client's measurements. Stand the tape measure on its edge to measure accurately around curves of a pattern.

Figure 17.1

width. The amount of overlap should be half the measurement of the alteration. For example, when decreasing the length or width 1 inch, the cut pieces should be lapped 1/2 inch. Since 1/2 inch is removed from each cut piece, a total of 1 inch is removed from the total length or width.

- Be aware that up to 2 inches may be added or subtracted at the seam line when altering the width of a pattern piece. Divide the required amount to be increased or decreased by the number of seams and add or subtract the resulting amount at each seam.
- Draw a line between two designated points when increasing or decreasing at a location such as the shoulder seam. Slash the pattern piece between the two points. Leave the pattern piece intact. Spread or lap the slashed area the appropriate amount. Measure the alteration at the seam line to ensure accuracy.
- Redraw cutting or stitching lines as necessary. When an alteration interrupts a cutting or stitching line, draw a new line on the pattern. Taper the line gradually and smoothly into the original line. This keeps the alteration from being obvious in the finished garment.
- Make sure all pattern pieces are flat when alterations are completed. When a pattern piece is slashed, bubbles can form. Press bubbles flat before placing the pattern on the fabric for cutting.
- Keep grain lines and place on fold brackets matched when repositioning pattern pieces.
- Use designated alteration lines printed on the pattern pieces when appropriate.
- Be aware of alterations that may affect other pattern pieces. An alteration to one pattern piece may require a corresponding alteration elsewhere or a matching alteration on pieces that join the changed piece.

Figures 17.2 - 17.9 illustrate selected procedures for performing basic pattern alterations.

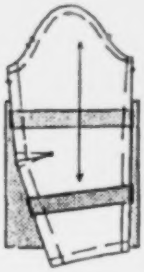
Fitting the Pattern

Once pattern alterations are completed, the employee should determine if the alterations are correct by fitting the pattern on the client. To fit the pattern on the client, the employee attaches the pattern pieces together and fits them on the client's body. It is not necessary to attach all of the pattern pieces. Correct fit can be determined by fitting only half of the pattern (either the right half or the left half). Pattern pieces should be attached to one another as follows:

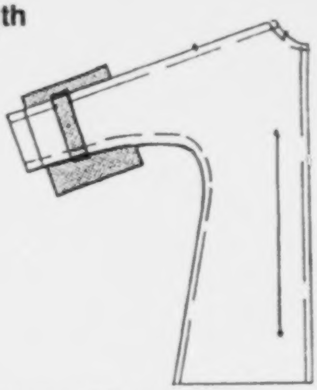
- Cut out basic pattern pieces such as the bodice, skirt, and sleeves. Additional pattern pieces such as collars, facings, pockets, and belts are not needed during the fitting process.
- Trim to the cutting lines around curved areas such as the neckline, armseye, waistline, and crotch.
- Press the pattern pieces if needed using low, dry heat.
- Reinforce curved areas by applying transparent tape to the seam lines.
- Clip the seam allowances on the neckline curve and the lower portion of the armhole to the seam line at 1/2 inch intervals. Do not clip across the top of the armhole.
- Pin in pleats, darts, and hems according to marked lines. Darts should be folded as indicated on the pattern guide sheet but folded to the outside. Pins should be parallel to and on the stitching lines, with the exception of the pins at the wide end of the dart. The pins at the wide end of the dart should cross the seam line.
- Pin the pattern pieces together with pins parallel to and on the seam lines. Pins should be placed on the outside of the pattern. Do not pin the entire pattern together. Pin units, such as the bodice unit and the sleeve unit, but do not pin the units together.

After the pattern pieces are pinned together, the employee must determine if the pattern fits the client properly. There are two methods for placing the pattern on the client

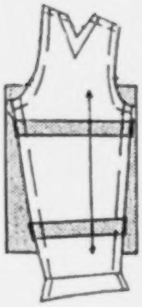
Increasing Length



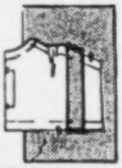
Fitted Sleeves
Add length at the designated alteration line(s). Use the measurement for elbow dart placement to determine the amount of length to add at each alteration line.



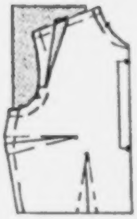
Kimono Sleeves
Add length at the designated alteration line. Only one alteration line is needed since the kimono sleeve is not fitted.



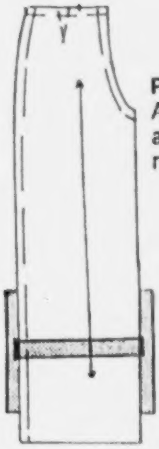
Raglan Sleeves
Add length at the designated alteration line(s). If two lines are given, add half the amount at each line to keep the sleeve shape.



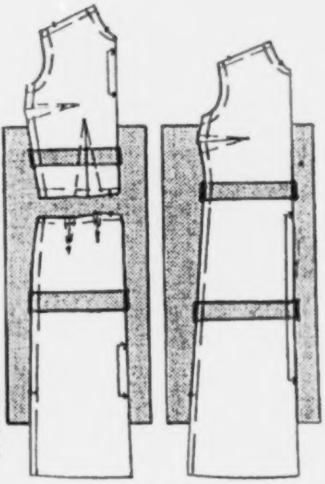
Shoulder Yokes
Add length by slashing the yoke pattern piece. Spread as needed. Alter bodice so seams are the same length.



Shoulder Seams
Add length by cutting the pattern from midway on the shoulder seam to the armhole seam line near the notch. Spread as needed.



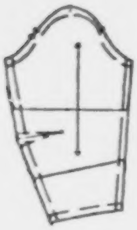
Pants
Add length at the designated alteration line. Spread as needed.



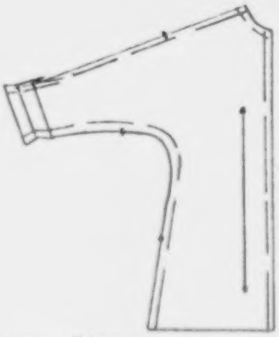
Dresses and Skirts
Add length at either a designated alteration line (at appropriate location above or below waist), above the waist mark at center back (to alter waist length), or below the waist mark (to alter the finished length).

Figure 17.2

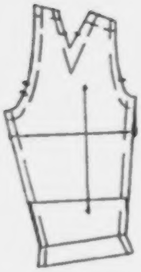
Decreasing Length



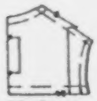
Fitted Sleeves
Decrease length at the designated alteration line(s). Use the measurement for elbow dart placement to determine the amount to decrease at each alteration line.



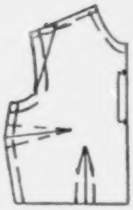
Kimono Sleeves
Decrease length at the designated alteration line. Only one alteration line is needed since the kimono sleeve is not fitted.



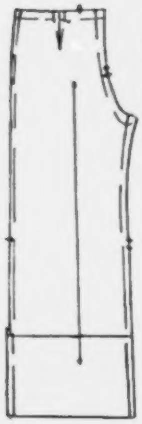
Raglan Sleeves
Decrease length at the designated alteration line(s). If two lines are given, decrease half the amount at each line to keep the sleeve shape.



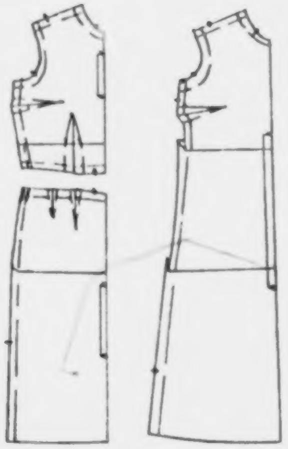
Shoulder Yokes
Decrease length by slashing the yoke pattern piece and lapping the edges as needed. Alter bodice so seams are the same length.



Shoulder Seams
Decrease length by cutting the pattern from midway on the shoulder seam to the armhole seam line near the notch. Lap the edges as needed to decrease the required amount.



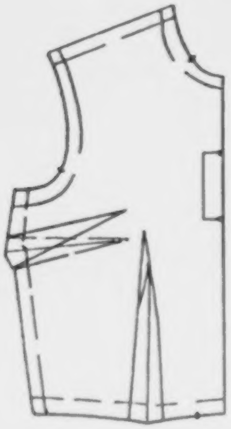
Pants
Decrease length at the designated alteration line. Lap the edges as needed to decrease the required amount.



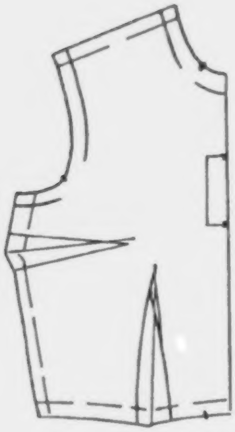
Dresses and Skirts
Decrease length at either a designated alteration line (at appropriate location above or below waist), above the waist mark at center back (to alter waist length), or below the waist mark (to alter the finished length).

Figure 17.3

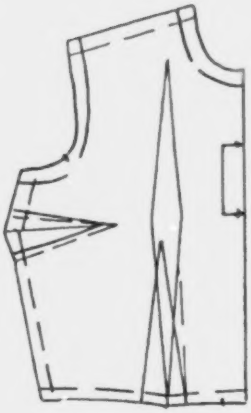
Bust Alterations



Raising Bust Darts
Raise bust darts by marking the location of the new dart point above the original dart. Draw new dart stitching lines to the new dart point. Taper the new stitching lines into the original stitching lines.



Lowering Bust Darts
Lower bust darts by marking the location of the new dart point below the original dart. Draw new dart stitching lines to the new dart point. Taper the new stitching lines into the original stitching lines.

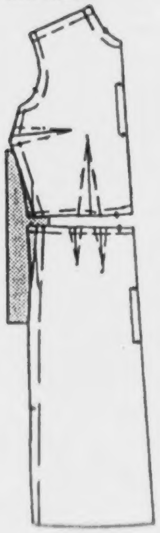


Enlarging the Bust Area of a Fitted Bodice
Enlarge the bust by cutting the pattern from the waist to the shoulder seam. Cut along the fold line of the waist dart and cut through the mark for the bust point. Cut the side bust dart on the fold line to within 1/8" of the bust point. Spread the vertical cut at the bust point by half the amount needed. Do not spread at the waist or shoulder. Locate the dart point within the cuts and redraw the dart stitching lines. Taper the new stitching lines into the original stitching lines.

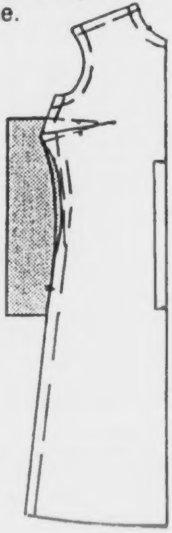
Figure 17.4

Increasing the Waistline

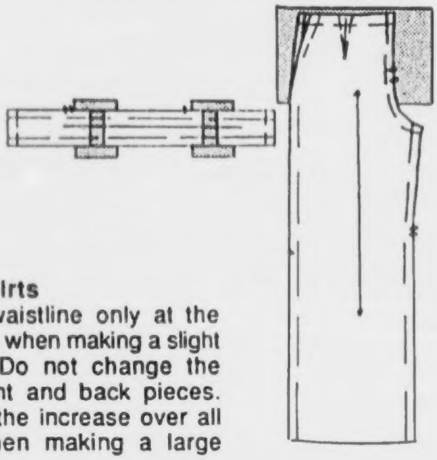
Fitted Dresses
Increase the waistline on the skirt and the bodice seam lines at the waist. Increase the same amount on both the bodice and the skirt.



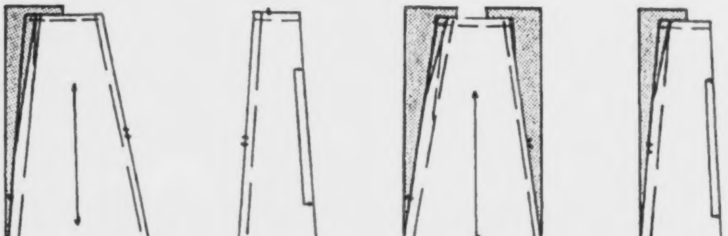
A-line Dresses
Increase the waistline at the waist only. Taper the adjustment into the seam line.



Pants
Increase waistline by adding 1/4 the total amount to be increased to each side seam (front and back pieces). When adding large amounts, add to the front and back crotch seams as well as the side seams. Taper to nothing at the curve of the crotch seam. Enlarge the waistband by the same amount and in the same places that the waist was increased. Cut and spread the waistband the amount needed.



Gored Skirts
Increase waistline only at the side seams when making a slight increase. Do not change the center front and back pieces. Distribute the increase over all seams when making a large increase.

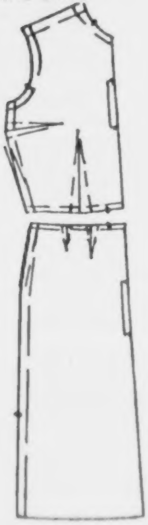


Slight Increase **Large Increase**

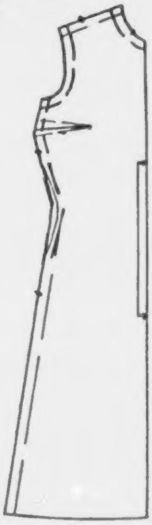
Figure 17.5

Decreasing the Waistline

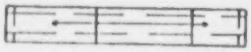
Fitted Dresses
Decrease the waistline on the skirt and the bodice seam lines at the waist. Decrease the same amount on both the bodice and the skirt.

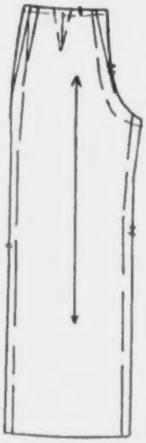


A-line Dresses
Decrease the waistline at the waist only. Taper the adjustment into the seam line.

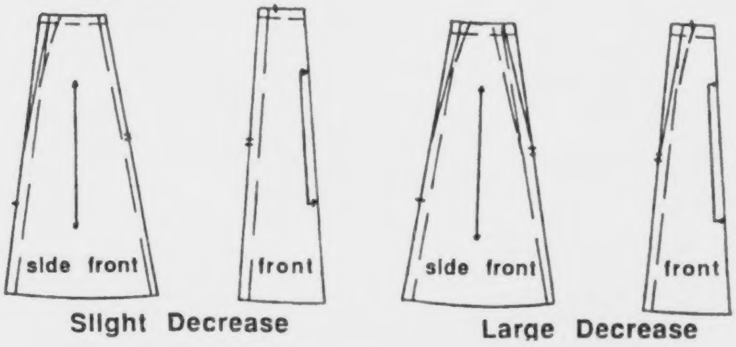


Pants
Decrease waistline by removing 1/4 the total amount to be decreased from each side seam (front and back pieces). When decreasing large amounts, decrease the front and back crotch seams. Taper smoothly into the original cutting line. Decrease the waistband by the same amount and in the same places that the waist was decreased. Cut and lap the waistband the amount needed.





Gored Skirts
Decrease the waistline only at the side seams when making a slight decrease. Do not change the center front and back pieces. Distribute the decrease over all seams when making a large decrease.



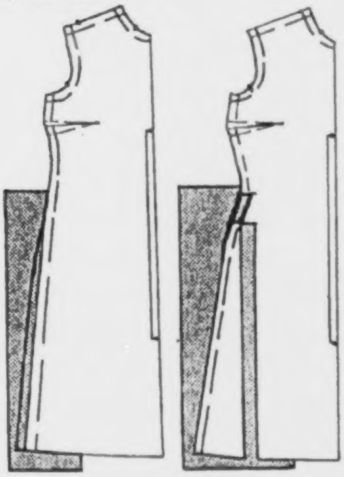
Slight Decrease **Large Decrease**

Figure 17.6

Increasing the Hip Line

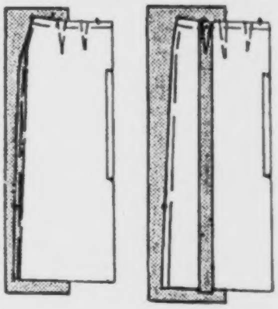
A-line Dresses

Increase the hip line at the side seams when increasing by 2" or less. Slash the pattern parallel to the grain line symbol when making an increase of more than 2". Spread 1/4 of the amount of the increase on the front and back pieces.



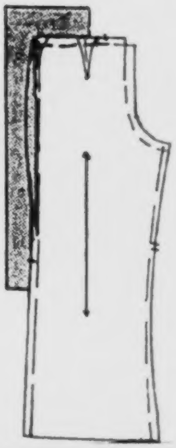
Fitted Skirts

Increase the hip line only at the side seams when increasing by 2" or less. Do not change the center front and back pieces. Slash the pattern parallel to the grain line symbol when making an increase of more than 2". Spread 1/4 of the amount of the increase on the front and back pieces and add a waist dart.



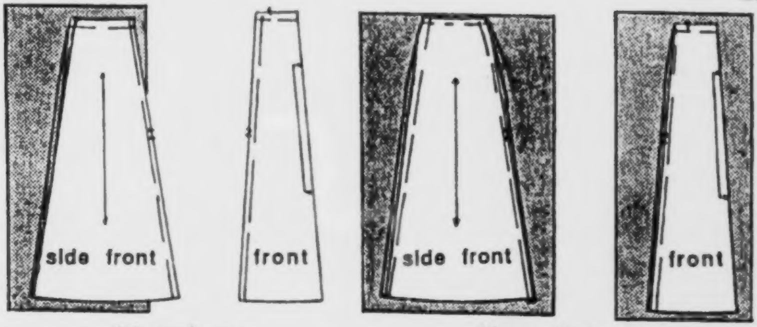
Pants

Increase the hip line at the side seams. Add 1/4 the total amount of the increase to each side seam (front and back pieces). Taper to the original cutting line at the waist and thigh.



Gored Skirts

Increase the hip line only at the side seams when increasing by 2" or less. Do not change the center front and back pieces. Distribute the increase over all seams when making an increase of more than 2". Taper to nothing at the waistline.

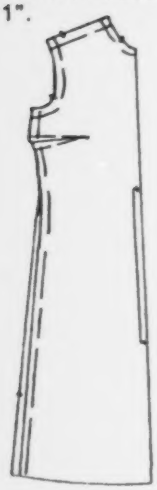


2" or Less **More than 2"**

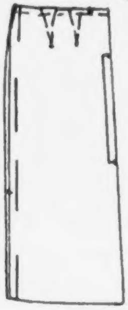
Figure 17.7

Decreasing the Hip Line

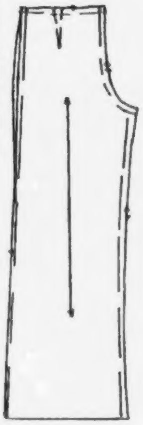
A-line Dresses
Decrease the hip line at the side seams. Taper into the waistline. Do not decrease by more than 1".



Fitted Skirts
Decrease the hip line only at the side seams when increasing by 2" or less. Do not change the center front and back pieces.



Pants
Decrease the hip line at the side seams. Remove 1/4 the total amount to be decreased from each side seam (front and back pieces). Taper to the original cutting line at the waistline. Do not decrease more than a total of 1" since style lines may be lost.



Gored Skirts
Decrease the hip line only at the side seams when decreasing by 1" or less. Do not change the center front and back pieces. Distribute the increase over all seams when making an increase of up to but not more than 2". Taper to nothing at the waistline.

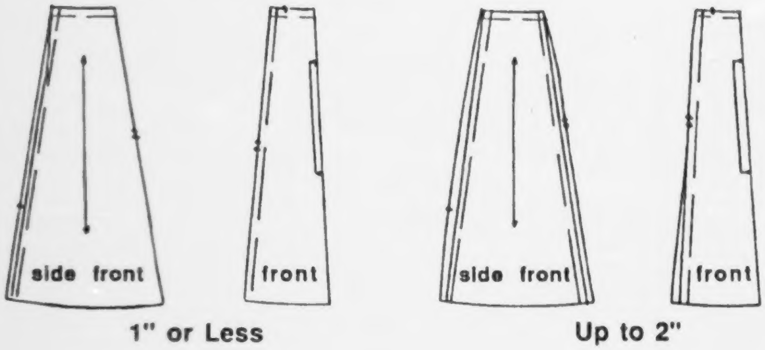
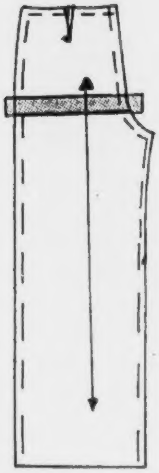


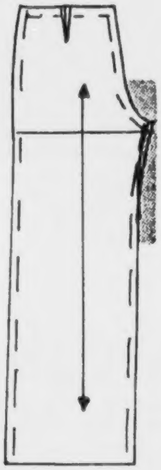
Figure 17.8

Crotch Alterations

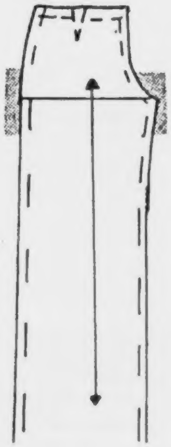
Increasing Crotch Depth
Add length at the designated alteration line. Spread the amount needed on both the front and back pieces.



Increasing Crotch Length (Crotch Point Method)
Draw a crotch line from the side seam to the crotch point (if not already on the pattern). Extend the line at the crotch point the amount needed. Draw new cutting lines at the inseam and crotch.



Decreasing Crotch Depth
Decrease the length at the designated alteration line. Lap the edges as needed to decrease the required amount. Alter the front and back pieces the same amount.



Decreasing Crotch Length (Crotch Point Method)
Draw a crotch line from the side seam to the crotch point (if not already on the pattern). Shorten the line at the crotch point the amount needed. Draw new cutting lines at the inseam and crotch.

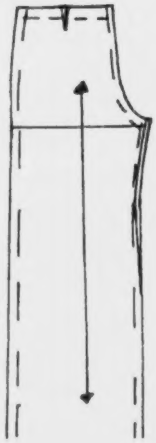


Figure 17.9

for fitting. The pattern may be slipped onto the client's body and checked for fit, or the pattern may be attached to grosgrain ribbons that have been placed around the client's body.

When using the ***grosgrain ribbon method***, the employee places grosgrain ribbons around the client at the normal waistline, the fullest areas of the hip line, and just above the fullest part of the bust line. Once the ribbons are in place, the employee can pin the pattern to the ribbons and check the fit. When the pattern is fitted, the client should wear the undergarments that will be worn with the garment.

As each pattern unit is placed on the client's body, the employee should check to see if the unit fits properly. Characteristics of good pattern fit are included in table 17.2. If a pattern unit does not fit correctly, the employee should note where fitting problems occur and alter the appropriate pattern

Characteristics of Good Pattern Fit

Bodice

- √ front and back are the correct length
- √ width is appropriate at shoulders, back, bust, and waistline
- √ shoulder seam lies flat along the shoulder and divides the shoulder equally from front to back
- √ sleeve contains sufficient ease across the back of the shoulders when arms are folded across the chest
- √ bust line and waistline contain sufficient ease
- √ diagonal wrinkles do not appear
- √ darts are positioned correctly and are the correct size
- √ size of the neckline is appropriate

Skirt

- √ side seam from waistline to hemline is in line with shoulder seam
- √ width is appropriate at waistline and hip line and allows for sufficient ease
- √ darts are positioned correctly and are the correct size
- √ diagonal wrinkles do not appear
- √ all vertical seams and grain line symbols hang perpendicular to the floor
- √ hem allowance is sufficient

Sleeves

- √ length of sleeve from shoulder to elbow and elbow to wrist is appropriate
- √diagonal wrinkles do not appear
- √width and ease of the sleeve cap and the upper and lower arm is sufficient
- √ elbow darts are positioned correctly

Pants

- √ front and back crotch depth is the appropriate length
- √ width at the waistline and hip line is sufficient
- √darts are positioned correctly and are the correct size
- √diagonal wrinkles do not appear
- √ vertical seams and grain line symbols hang perpendicular to the floor
- √ hem allowance is sufficient

Table 17.2

pieces. In some cases, a pattern piece that was previously altered may require an additional alteration.

When performing pattern alterations after checking the fit of the pattern, the employee should be aware that the same alteration may not be needed on both the front and back or right and left sides of the pattern pieces. For example, the front bodice may require a decrease in length while the back bodice may require an increase in length. One side of the bodice may require an increase in length while the other side may not require any change in length. Patterns often require uneven alterations unless the body is perfectly balanced and symmetrical.

After completing additional alterations, the employee should place the pattern units on the client again and check for proper fit. The employee should continue to alter and fit the pattern until the pattern units fit the client properly. Once alterations to the pattern pieces are completed and the pattern units fit the client properly, the pattern may be placed on the fabric for cutting.

The following guidelines should be observed when fitting patterns:

- Ask the client to verify if areas such as the waistline, center front, center back, and shoulder lines are accurately located when fitting the pattern.
- Do not fit the pattern too tightly. Allow ample ease for the design of the garment. Take the client's personal preferences into consideration when fitting the pattern.
- Use pins or light pencil markings to mark areas requiring further alterations.
- Press pattern pieces as needed using low, dry heat. Avoid pressing over tape used to make alterations.
- Redraw all grain lines, fold lines, and cutting lines after pattern alterations are complete in order to preserve the garment's original lines.

◆ Essential Questions: ◆ Pattern Alteration

1. What three steps must be completed in performing basic pattern alterations?
2. Why do some of the client's measurements need to be compared to the measurements of the actual pattern pieces?
3. When several pattern alterations will be made, what alterations should be completed first? Why?
4. What guidelines should be followed to ensure accuracy when completing pattern alterations?
5. Why should the pattern be placed on the client's body after alterations are completed?

SPECIAL ALTERATION TASKS

Basic alteration techniques remain the same regardless of specific situations. Special alteration tasks that may arise include altering children's patterns, combining pattern styles, and combining pattern sizes.

Altering Children's Patterns

Children's patterns often require length and width alterations. The techniques for performing basic pattern alterations can usually be used to alter patterns for children's garments. In addition to basic pattern alterations, a client may request that special pattern alterations be done to children's patterns to provide for growth in height and width. Clients may request these alterations since garments that provide for growth in height and width can be worn for longer periods of time.

The following features can be easily incorporated into children's patterns to provide for growth in height:

- Include deep hems or tucks at the bottoms of sleeves and garments. Hems can be as deep as 5 inches.
- Add tucks at the waistlines of dresses and pants to lengthen the upper part of the dress or lengthen the crotch.
- Place adjustable, long straps on jumpers, sun dresses, and overalls.
- Add horizontal tucks to yokes.
- Make shirts and blouses extra long.

To provide for growth in width, the following alterations can be made to children's patterns:

- Change set-in sleeves to cap, raglan, or kimono styles.
- Add tucks, pleats, or gathers at the shoulder line.
- Include large underarm or leg seams.

Combining Pattern Styles

Occasionally, a client may want to combine features from different patterns. For example, a client may like the sleeves of one design and the bodice of another design. Patterns of different styles often can be combined to achieve the look the client desires.

Within each size range of the same brand of pattern, the structural body relationships, such as shoulder to neck and bust to waist, remain the same. A size twelve bodice from one style number will fit a size twelve skirt from another style number as long as the patterns are the same brand. Necklines, collars, sleeves, and other features from two different style numbers of the same brand of pattern may be combined if the structural features are the same. To determine if two patterns can be combined, the employee may want to construct a sample garment using muslin.

When combining patterns, the employee should study the patterns carefully before substituting collars and sleeves. The necklines of two bodice patterns should match line for line in order for the collar from one to be used on the other. Therefore, collars of different styles should be interchanged only when the bodice pieces match closely. In addition, the location of the closing should be the same.

The style of the bodice controls the size of the sleeve cap and the amount of ease. Therefore, the style of the bodices should be similar if sleeves will be interchanged. In addition, the shoulder seams of the two bodices should be at the same angle and end at the same point where the arm joins the body, and the armhole curves should be alike.

Combining Pattern Sizes

Few figures are perfectly balanced and symmetrical. Often a client's upper body and lower body will be different sizes. Therefore, it is sometimes easier to combine two pattern sizes rather than make major alterations to one pattern size. Many patterns are available with a range of sizes included in one pattern envelope. Instructions are often included for combining the sizes.

When adjusting the waistlines of two pattern sizes, the employee should note the difference in the waistline measurements of the two sizes. If the client's waistline measurement is the same as one of the patterns, the other pattern should be adjusted to correspond. To adjust the waistlines of both patterns to the same measurement, the employee should determine the amount by which each waistline must be enlarged or reduced. This amount should be divided among the seams, and each pattern piece should be adjusted accordingly.

The following general guidelines should be observed when combining patterns of different sizes:

- Keep center fronts, center backs, and grain lines straight.
- Adjust waistline darts on fitted garments so they match when joined. In women's dress patterns, move either the bodice or skirt darts.
- Cut apart patterns without waistlines and tape the skirt and bodice sections of the two patterns together.

◆ Essential Questions: ◆ Special Alteration Tasks

1. Why do clients often request that children's patterns be altered to provide for growth in height and width?
2. Why should patterns that will be combined be of the same brand?
3. Why are patterns of different sizes often combined?

Chapter Highlights

- Lengthwise grain should be perpendicular to the floor at the center front and center back of a garment. Crosswise grain should be parallel to the floor at the center front and center back of a garment.
- A garment that is balanced hangs the same distance from the body from right to left and front to back, is on-grain, and has sufficient ease.
- Ease, which is determined by factors such as current fashion, body build, activity, and type of fabric, should be distributed evenly to each side of a garment.
- Garments should set smoothly over body bulges without wrinkling, bulging, sagging, or straining.
- Silhouette seams and circumference seams are types of construction lines that help indicate direction, length, width, and straightness in a garment.
- The client's exact measurements are necessary in order to choose a pattern that will require the least amount of alterations.
- When a pattern requires alteration, the employee should take the client's measurements, compare the client's measurements with the measurements on the pattern, and then perform the required alterations. In the second step, it is sometimes necessary to compare the client's measurements with measurements of the actual pattern pieces.
- Basic pattern alterations include increasing length, waist, hip line, crotch depth, and crotch length; decreasing length, waist, hip line, crotch depth, and crotch length; raising bust darts; lowering bust darts; and enlarging the bust area.
- When alterations are complete, pattern pieces should be attached and placed on the client's body to check for proper fit.
- Children's patterns may be altered so garments will allow for growth in height and width.
- Patterns of different styles or patterns of different sizes may be combined to achieve a desired look or fit.

Chapter 18

Unit Construction Techniques

Chapter Focus

The following Essential Knowledge and Skills are discussed in this chapter:

5D Differentiate procedures and techniques appropriate for varied production systems to achieve quality apparel products.

5E Utilize established production procedures and processes to achieve quality standards in finished products.

Chapter Vocabulary

bias
layout
preshrinking
tailor's tack
true bias
unit
unit method of construction

Read chapter sections for additional terms related to patterns and basic construction terms.

Employees in the textile and apparel industries must be skilled in time management techniques in order to complete garments quickly. One method that incorporates effective time management is the unit method of garment construction. The ***unit method of construction*** is an organized way of completing one unit or section of a garment at a time. Each individual piece of a garment is a ***unit***. As a garment is constructed, pieces of the garment are combined to form new units. The unit method of construction is often used by apparel manufacturers when mass producing garments.

Since it is easier to work with smaller areas, construction should be completed within each unit before units are sewn together. Darts, tucks, gathers, and pleats should be stitched; details such as buttonholes should be completed; staystitching should be completed; and interfacing should be applied. Once construction is completed, the units should be pressed. After being pressed, the units may be sewn together.

Before unit construction can begin, the employee must place the pattern pieces on the fabric, cut the fabric, and mark details on the fabric. Once the fabric is marked, units can be constructed. After units are sewn together, the garment should be fitted on the client.

PATTERNS

Patterns are usually packaged in pattern envelopes. Information about a pattern is printed on the front and the back of the pattern envelope. Examples of both the front and the back of a pattern envelope are included in Chapter Sixteen. The pattern envelope also contains pattern pieces and a pattern guide sheet. Each pattern piece is usually marked with the name of the piece and a letter for easy identification. Each pattern piece also may include the pattern number, the size of the pattern, and the number of pieces to cut.

Pattern Symbols

A variety of symbols that serve as guides when cutting and sewing appear on pattern pieces. ***Pattern symbols***, or ***pattern markings***, are images on the pattern pieces that identify specific construction details such as grain lines, stitching lines, seam allowances, and notches. Common pattern symbols include the following:

- ***adjustment line*** or ***alteration line*** - An adjustment line, or alteration line, is a double line that indicates where the length of a pattern piece may be increased or decreased if needed.
- ***buttonhole symbol*** - A buttonhole symbol is a solid line that indicates the length and exact location of a buttonhole.
- ***center front marking*** and ***center back marking*** - The center front marking and center back marking both consist of a solid line identifying the location of the center of a garment. These markings are usually clearly labeled and may also be identified by a seam line, fold line, or other solid line.
- ***cutting line*** - A cutting line is the heavy outline around the perimeter of a pattern piece. Cutting lines indicate where the fabric should be cut.
- ***dart symbol*** - A dart symbol consists of dots and stitching lines that meet at a point. Dart symbols indicate the correct position of darts.
- ***dot*** - A dot is a round marking that is used to match adjoining pattern pieces. These markings may also be in the shape of a triangle or square.
- ***grain line marking*** - A grain line marking is a straight line with arrows at each end. It appears on pattern pieces that are not cut on a fold. The grain line marking should be placed parallel to the selvage. A selvage is a narrow, woven edge made with special, strong yarns that are woven tightly to prevent raveling.
- ***hemline*** - A hemline is a solid line that indicates the suggested finished edge or length of a garment.
- ***notches*** - Notches are diamond-shaped symbols used to correctly match pattern pieces during construction.
- ***placement line*** - A placement line is a solid or broken line indicating the exact location of zippers, pockets, trims, and pleats.
- ***place on fold bracket*** - A place on fold bracket is a solid line with directional arrows. The arrows indicate that the outer line should be placed on the folded edge of the fabric.
- ***stitching line*** or ***seam line*** - A stitching line or seam line is a broken line that indicates where seams should be sewn.

Examples of these pattern symbols are included in figure 18.1.

Pattern Guide Sheet

The ***pattern guide sheet*** is a set of instructions for using the pattern. The pattern guide sheet contains general information, cutting layouts, and sewing directions. The front of the guide sheet usually contains general information such as the following:

- drawings of the front and back views of each garment
- a diagram of all pattern pieces

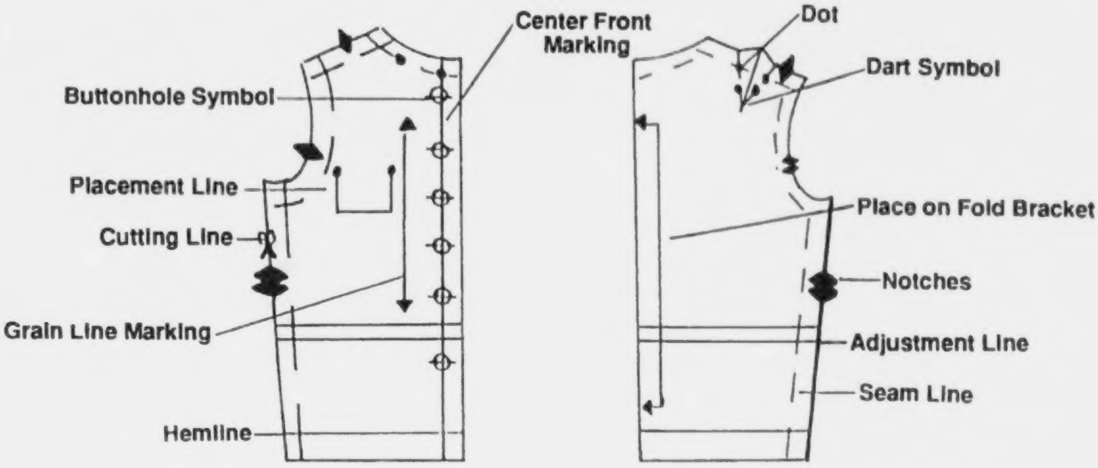


Figure 18.1

- descriptions of pattern symbols included on the pattern pieces
- directions for preparing the pattern and laying it out on the fabric
- instructions for transferring markings from the pattern pieces to the fabric
- definitions of special terms used in the directions
- an explanation of how to lengthen and shorten the pattern pieces
- an explanation of the shading used to distinguish different fabric layers and the reverse sides of pattern pieces

A ***cutting layout*** is a diagram that shows how to position the pattern pieces on the fabric. Diagrams of several different cutting layouts are usually included on the guide sheet. The cutting layout to be followed should be chosen according to the view being constructed, the pattern size, and the width of the fabric. Once the appropriate cutting layout is chosen, it should be circled so it will be easy to locate when the pattern is laid out and pinned.

Sewing directions are usually located on the back of the guide sheet. An additional guide sheet containing sewing directions may be included in patterns that have several views or garments. ***Sewing directions*** are step-by-step instructions that explain how to sew garment pieces together. Each step usually includes an illustration to aid in understanding the procedure to be performed.

An employee should study the pattern guide sheet thoroughly before placing the pattern on the fabric. Failure to understand the guide sheet and follow directions can result in ruined fabric and loss of time.

◆ Essential Questions: ◆ Patterns

1. What are pattern symbols? What purpose do they serve?
2. What types of general information are usually included on the pattern guide sheet?
3. What determines which pattern layout is chosen?

COORDINATION OF PATTERN AND FABRIC

Fabric should add to the appearance of a garment and express the design of the pattern. Characteristics such as the texture and weight of a fabric help determine if the fabric is appropriate for use with a specific pattern. It is difficult for a sagging fabric to hold a crisp, molded shape and for a stiff fabric to form soft gathers.

The color and design of a fabric also determine if the fabric is appropriate for use with a specific pattern. Garment details can be lost on a printed fabric, and a fabric with a large pattern may lose its look when cut into a number of pieces by garment lines. In addition, it may be difficult to match the design. Some garment designs are not suitable for fabrics with slanting, plaid, or striped designs.

Preparation of Fabric

Before pattern pieces are placed on the fabric and the fabric is cut, the fabric must be prepared. Most fabrics should be preshrunk and straightened before pattern pieces are cut out. When fabric is prepared properly, the fabric pieces can be sewn together easily, and the garment will fit properly upon completion and after wearing and laundering.

Preshrinking. ***Preshrinking*** is the process of shrinking fabric before construction of a garment in order to minimize further shrinkage during laundering or dry cleaning of the completed garment. Preshrinking also removes some fabric finishes that can cause stitching problems on some fabrics.

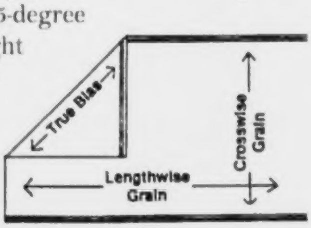
There are several methods for preshrinking fabric. The method that is used depends upon how the completed garment will be cleaned. The following methods may be used to preshrink fabric:

- hand-washable fabric - Fold the fabric and place in hot water for thirty minutes.
- washable fabric - Place in the washing machine with a regular load of laundry. Dry by laying flat with edges square or placing in a tumble dryer. Zigzag or hand overcast the raw edges before washing if the fabric will ravel.
- dry cleanable fabric - Have the fabric dry-cleaned by a professional dry cleaner or dry-clean in a self-service dry cleaning machine.

Interfacing, linings, and notions, such as trims and zippers, should also be preshrunk. Bias tape, however, should not be preshrunk. Trims and tapes may remain wrapped on their cardboard during preshrinking. The cardboard should be bent slightly to allow for shrinkage of the trim or tape. Trims and tapes should be placed in hot water for thirty minutes.

Straightening. Before the pattern is placed on the fabric, it is important to determine if the fabric is on-grain. A fabric is on-grain when the lengthwise yarns and crosswise yarns are at perfect right angles. A fabric is off-grain if the lengthwise yarns and crosswise yarns do not lie at right angles. Off-grain fabric must be straightened. If fabric is off-grain when garment pieces are cut out, the garment may pull to one side of the body and the hemline may hang unevenly.

Pattern pieces cut from fabrics that are off-grain are cut on the bias. ***Bias*** is any direction other than lengthwise or crosswise grain. ***True bias*** is at a 45-degree angle to any straight edge when grains are perpendicular. Fabric cut on the bias has more elasticity than fabric cut on-grain. Garment pieces cut on the bias have a tendency to sag and stretch. In addition, garment pieces that are cut on the bias do not hold their shape. Additional information re-



garding grain line is located in Chapter Six and Chapter Twelve.

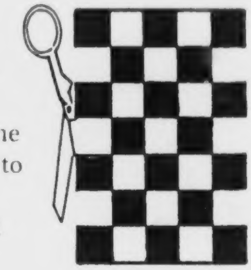
Before the grain of a fabric can be determined, the ends of the fabric should be straightened. When fabric is cut from the bolt, the edges are often uneven. When the edges of the fabric are uneven, it is difficult to check the grain. The edges of the fabric can be straightened by tearing the fabric ends, cutting along a prominent design line, or pulling a crosswise yarn.

The ends of some woven fabrics can be straightened by tearing the fabric. Firmly woven fabrics tear best. The following procedure should be observed when tearing fabric:

- Make a short cut through one selvage.
- Grasp the fabric on either side of the cut.
- Tear the fabric 5 or 6 inches at a time.
- Grasp the fabric near the end of the previous tear and tear 5 or 6 more inches.
- Continue tearing in 5 or 6 inch increments until the other selvage is reached.
- Cut through the other selvage rather than attempting to tear it.

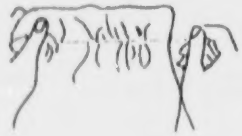
Most woven fabrics may be torn. Tearing should be done carefully, however, since some fabrics may snag, stretch, or be pulled off-grain.

If the fabric has a prominent design, such as a plaid, check, or other woven design, the fabric may be cut along one prominent line from selvage to selvage to straighten fabric ends. Cutting should begin at the selvage edge and continue along the selected line to the opposite selvage.



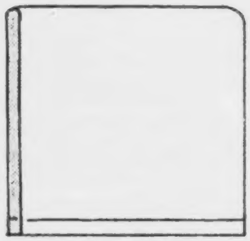
If a prominent design line is not clearly visible, one crosswise yarn should be pulled from the fabric to create a mark that can be used as a cutting line. Crosswise yarns can be removed from fabric in the following manner:

- Clip the selvage.
- Find the end of one crosswise yarn.
- Place the left hand on the fabric and pull the crosswise yarn gently and slowly.
- Push the fabric along the yarn gently.
- Alternate pulling the yarn and pushing the fabric until the opposite selvage is reached.



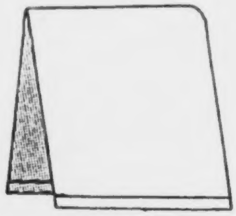
Once the crosswise yarn is removed, the fabric may be cut along the mark that has been created. Crosswise yarns can be pulled easily from loosely woven, soft, or stretchy fabrics. This method of straightening the ends of fabric is slower than tearing, but it is safer for delicate fabrics.

Once the ends of the fabric are straight, the fabric can be checked to determine if it is on-grain. To check the grain of the fabric, the employee should fold the fabric lengthwise and match the selvages. The fabric is on-grain if the crosswise ends of the fabric match and are at right angles to the selvage. The fabric is off-grain if the edges do not match or the fabric puckers when the edges are matched.



on-grain

Off-grain fabrics can often be straightened. An effective way to straighten fabric is to fold the fabric in half so that the selvages are together and pull on the two opposite corners



off-grain

that are too short until the lengthwise and crosswise yarns form right angles when the fabric is folded. This method is easier if two people pull the fabric. One person can pull on each corner of the fabric. When the fabric is more than two yards in length, it is best to pull the fabric in one or two-yard increments until the entire length is straightened. The fabric should not be overstretched since this can permanently damage the fabric.

Once the fabric is straightened, it should be placed on a flat surface and the alignment of the edges should be checked. If the fabric is still off-grain, it may be dampened and the procedure may be repeated. If the edges of the fabric are aligned within 1/2 to 1 inch, the fabric has been straightened enough. The straightened fabric should be pressed before the pattern is placed.

Some fabrics cannot be straightened. For example, fabrics treated with heat-set finishes, such as a permanent-press finish, cannot be straightened. If a fabric cannot be straightened, it may be necessary to cut out the pattern pieces individually rather than laying out the entire pattern on the fabric. Each pattern piece should be placed on-grain and then cut out. When two pieces must be cut from one pattern piece, such as a bodice front left and bodice front right, the pattern piece should be inverted when cutting the second piece to avoid having both pieces identical (two bodice front left or two bodice front right).

Pattern Layout and Cutting

After the pattern is altered and the fabric is prepared, the pattern may be laid out. ***Layout*** is the placement of the pattern pieces on the fabric. The directions on the pattern guide sheet for proper cutting layout should be followed carefully or garment pieces may not fit together easily.

Before the pattern is laid out, all supplies needed for layout and pinning should be assembled. Supplies include pins, sharp cutting shears, a ruler, a tape measure, and the pattern guide sheet. Only the pattern pieces needed for the garment being constructed should be removed from the pattern envelope. Pieces that are printed on the same sheet should be cut apart. Pattern layout and pinning require concentration, so it is important to have all supplies assembled before any placement or pinning begins.

Folding Fabric. The cutting layout on the pattern guide sheet often shows the fabric folded. The fabric should be folded as shown in order for the correct number of garment pieces to be cut. Often, the cutting layout shows the fabric folded with the right sides facing in. When the right sides of the fabric are facing in, markings are easier to transfer and the right side of the fabric is protected from soil or dirt. Fabrics with prints, stripes, or plaids are usually folded with the right sides facing out so the fabric design can be matched more easily.

The right side of the fabric may be obvious if it has an obvious pattern, print, or nap. Sometimes, however, the right side of the fabric is not obvious. The right side of the fabric can sometimes be determined by looking at the way the fabric is rolled or folded on the bolt. On the bolt, the right sides of cotton and linen usually face out while the right sides of wool and most other fabrics usually face in. Also, the sides of the fabric can be compared. The right side may have more nap, a clearer print, more shine, or a more visible weave. If the right side of the fabric cannot be determined, either side may be designated as the right side. However, to avoid confusion, chalk marks may be placed on one side to designate it as the wrong side.

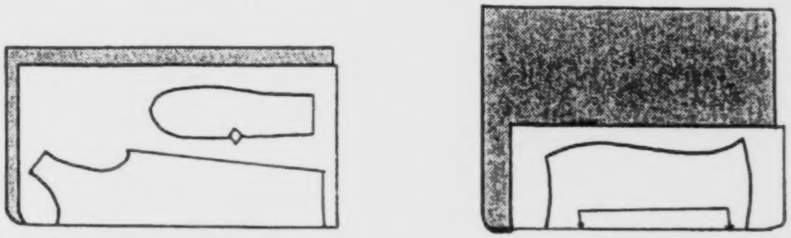
The cutting layout usually shows the fabric folded either lengthwise or crosswise. In some cases, the fold may be a double fold or a partial fold. Explanations of different types of folds are as follows:

- crosswise fold - The fabric is folded in half crosswise with the cut ends matched. The two layers of selvage should be even along each side.
- lengthwise fold - The fabric is folded in half lengthwise. The selvages and ends are matched.
- partial fold - The fabric is folded on the lengthwise grain. The fold is as wide as the widest part of the pattern piece.
- double fold - The fabric is folded twice along the lengthwise grain. The selvages usually meet in the center.

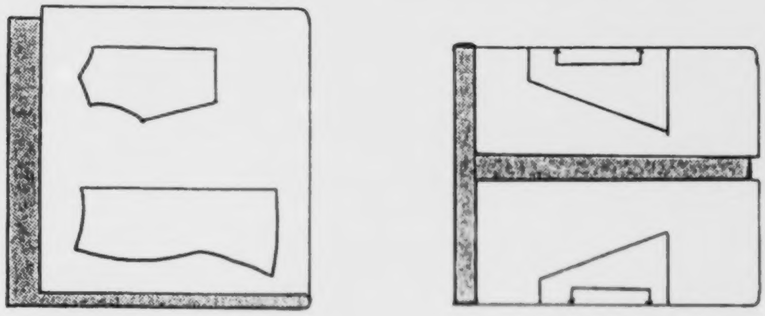
Examples of different types of folds are shown in figure 18.2.

Pattern Layouts for Special Fabrics. A fabric may have a design or texture that will affect the pattern layout procedure. Some fabrics have a design or texture that runs in only one direction. One-way designs have a distinct top and bottom. Both short-pile and deep-pile fabrics have a nap or texture that runs the entire length of the fabric. These fabrics must be cut with the design or nap running the same direction on all pieces. Extra fabric may be required when one-way or napped fabrics are used. If no information is given on the pattern envelope regarding the amount of napped or designed fabric required, the pattern pieces should be placed on the fabric to determine the amount needed. Additional information on napped fabrics and one-way designs is included in Chapter Twelve.

Plaid fabrics, some striped fabrics, and fabrics with geometric designs also affect the pattern layout procedure. Pattern pieces must be aligned with the design of the fabric. Notches and dots on the pattern pieces can be used to line up special fabric lines during pattern layout. Plaid, striped, or geometric fabric should not be used if the pattern designates that it is not suitable for use with these fabrics. Plaid, striped, and geometric fabrics should also be avoided when a garment includes long design lines such as princess seams or horizontal darts. Additional informa-



Lengthwise Fold **Partial Fold**

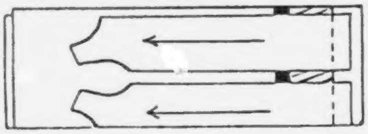


Crosswise Fold **Double Fold**

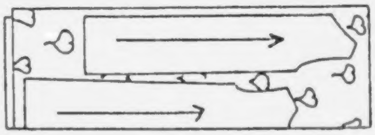
Figure 18.2

Pattern Layouts for Special Fabrics

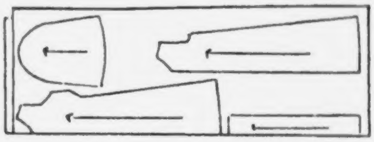
Border Prints
All pattern pieces should be placed on the crosswise grain. Hemline markings and the lower edge of the border design should be matched. Additional pattern pieces may be placed on the fabric available above the design.



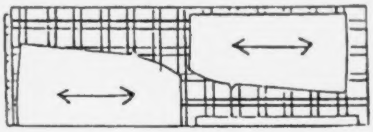
Directional Prints
The with nap cutting layout should be used. The design should be matched at the seam lines.



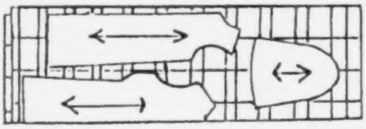
Napped Fabric
All pattern pieces should be placed facing in the same direction. To produce a richer color in corduroy and velvet, the nap should run up the garment. The with nap cutting layout should be used.



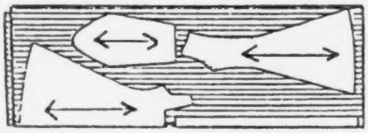
Even Plaid Fabric
The without nap cutting layout should be used. The center front and center back should be placed on a dominant line of the plaid. Plaids should be matched at the side seams and sleeves.



Uneven Plaid Fabric
The with nap cutting layout should be used. The center front and center back should be placed on a dominant line of the plaid. Plaids should be matched at the side seams and sleeves.



Evenly Striped Fabric
The without nap cutting layout should be used. The center front and center back should be placed on a dominant stripe when stripes are vertical. Stripes should be matched at the side seams and sleeves.



Unevenly Striped Fabric
The with nap cutting layout should be used. The center front and center back should be placed on a dominant stripe when stripes are vertical. Stripes should be matched at the side seams and sleeves.

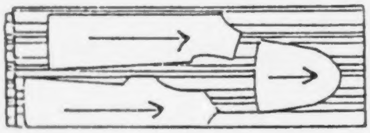


Table 18.1

tion on pattern layouts for special fabrics is presented in table 18.1.

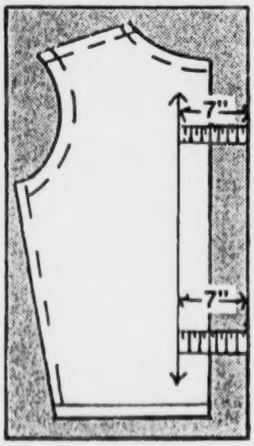
Pinning. Once the fabric is folded properly, any wrinkles should be smoothed. The fabric should be pinned together around the edges once the grain lines are straight. It is important to pin the fabric together since this prevents the fabric from moving as the pattern is laid out.

Before being placed on the fabric, each pattern piece should be trimmed. The number of pattern pieces to be laid out should correspond with the number of pieces shown on the pattern guide sheet. The pattern pieces should be placed on the fabric in the same position as shown on the cutting layout. The pieces should be placed as closely as possible without overlapping. Pattern pieces are usually placed with the printed side facing up. However, when pattern pieces are shaded on the cutting layout, they should be placed with the printed side facing down.

The grain line marking or fold line on a pattern piece should always be placed on the grain line of the fabric. Pattern pieces should not be angled in order to fit into a smaller area of fabric. This can result in part of the completed garment being off-grain. As each pattern piece is placed on the fabric, it should be pinned in place. Large pattern pieces marked with a place-on-the-fold bracket should be pinned first according to the following guidelines:

- Place the fold line of the pattern piece along the fold of the fabric.
- Pin along the fold approximately every 6 inches.
- Pin the corners of the pattern piece. Place pins diagonally in corners.
- Pin the edges of the pattern piece about every 6 inches. Place pins perpendicular to the stitching lines pointing toward but not over the cutting lines.

After all pattern pieces marked with a place-on-the-fold bracket are pinned, pattern pieces marked with the grain line marking should be pinned. These pieces should be pinned as follows:



- Pin each arrow of the grain line marking.
- Measure from the edge of the fabric to the point of each arrow.
- Unpin one end of the grain line marking and adjust until the measurements are the same.
- Repin when each end of the grain line marking is the same distance from the edge of the fabric.
- Pin the corners of the pattern piece. Place pins diagonally in corners.
- Pin the edges of the pattern piece approximately every 3 to 6 inches. Place pins perpendicular to the stitching lines pointing toward but not over the cutting lines.

When all pattern pieces are pinned in place, they should be counted. The number of pieces on the fabric should correspond to the number shown on the cutting layout. In addition, the pieces should be checked to be sure they are positioned correctly and the grain lines are straight.

Cutting. When all pattern pieces are pinned to the fabric accurately, the garment may be cut out. The following guidelines should be observed when cutting:

- Use sharp, bent-handled shears to cut. Do not use pinking shears.
- Cut along the designated cutting lines on the pattern.
- Use long, even strokes when cutting. Use the tips of the shears to cut notches and other difficult areas.
- Keep the fabric flat on the cutting surface during the cutting process. Place the free hand on the fabric near the cutting area.

Any lifting during cutting can cause distortions or inaccuracies.
- Cut with the grain line of the fabric. Some patterns have arrows or scissors printed on them to indicate the correct direction for cutting. Cut from the widest point to the narrowest point if the direction is not indicated.
- Cut notches outward from the marking. Cut double or triple notches as one by cutting straight across the top of the notches rather than between them.
- Leave the pattern pieces attached to the fabric after cutting until all markings are transferred.

Marking

Many of the pattern symbols on pattern pieces should be transferred to the fabric before the pattern is unpinned. These markings make it easier to assemble the garment. Markings should be visible when sewing, but they should not show on the outside of the completed garment. Markings can be made by using a tracing wheel and dressmaker's carbon paper, tailor's chalk, tailor's wax, or tailor's tacks. Sewing equipment and tools used when marking are discussed in Chapter Fourteen.

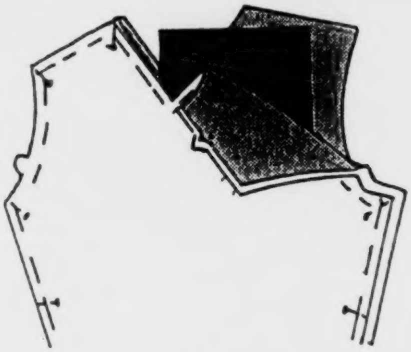
The following markings should be transferred to the fabric:
- construction markings such as dots, darts, tucks, and pleats
- placement lines for trims, buttons, buttonholes, and pockets
- fold lines
- center front and center back lines

Hems and seam allowances are usually not marked. Hems are measured after the garment is completed, and seam allowances can be measured during sewing by following the seam guides marked on the throat plate of the sewing machine.

Tracing Wheel and Dressmaker's Carbon Paper. A tracing wheel and dressmaker's carbon paper can be used to transfer pattern symbols to most fabrics. Light-colored dressmaker's carbon paper should be used on white and light-colored fabrics. Dressmaker's carbon paper of contrasting colors should be used to mark dark fabrics. All markings should be transferred to the wrong side of the fabric so they will not be visible on the right side of the completed garment.

The following steps should be completed when marking fabric in which the wrong sides are together:
- Unpin the pattern piece in the area that will be marked. Leave other pins in place.
- Place the waxy side of the carbon paper between the fabric layers against the wrong side of the fabric. Use two layers of carbon paper if a double layer of fabric is to be marked. Two pieces of carbon paper may be used, or one piece may be folded so the color to be transferred is facing out.
- Roll the tracing wheel over the pattern symbols to be transferred. Mark each dot with an X. Use a ruler when marking straight lines, and mark the end of each dart with a straight line.

Figure 18.3 shows the correct method of inserting dressmaker's carbon paper when the wrong sides of the fabric are together.



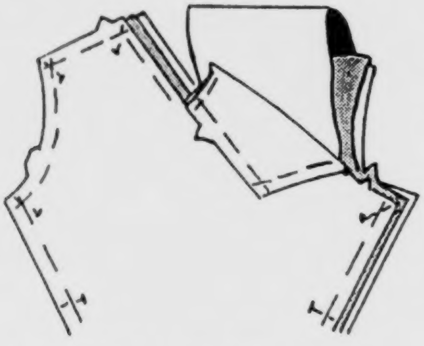
Wrong Sides of Fabric Together

Figure 18.3

When the right sides of the fabric are together, the fabric should be marked as follows:

- Unpin the pattern piece in the area that will be marked. Leave other pins in place.
- Place the waxy side of the carbon paper between the fabric and the pattern with the waxy side down. Also place carbon paper under the bottom layer of fabric with the waxy side up (if there is a double layer of fabric). The carbon paper should be facing the wrong sides of the fabric.
- Roll the tracing wheel over the pattern symbols to be transferred. Mark each dot with an X. Use a ruler when marking straight lines, and mark the end of each dart with a straight line.

Figure 18.4 shows the correct method of inserting dressmaker's carbon paper when the right sides of the fabric are together.



Right Sides of Fabric Together

Figure 18.4

When using a tracing wheel and dressmaker's carbon paper, the following guidelines should be observed:

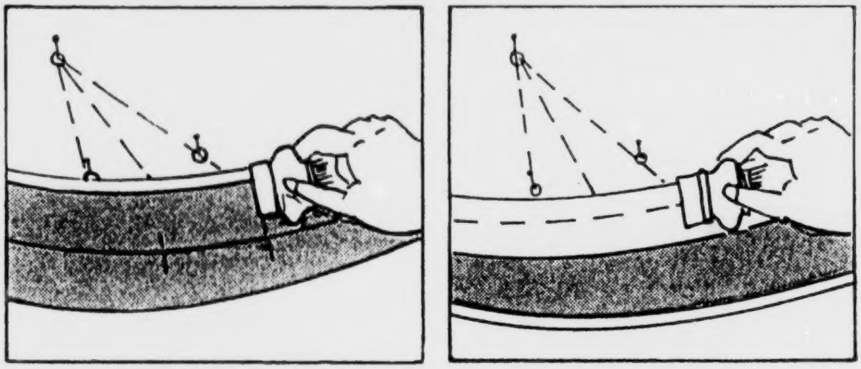
- Choose a color of dressmaker's carbon paper that is dark enough to be seen on the wrong side of the fabric but light enough so it will not be noticeable on the right side of the fabric.
- Test the carbon paper selected on a scrap piece of fabric before using it on the actual garment piece.
- Place cardboard between the cutting surface and the fabric to prevent the tracing wheel from marring the surface. A magazine or other firm material also can be used.

There are some disadvantages to using the tracing wheel and dressmaker's carbon paper. Markings may show on the right side of the fabric if the carbon paper color is too dark or if the markings are too heavy. Carbon paper markings are occasionally difficult to remove from some fabrics and may become permanent. Some fabrics can be punctured by the tracing wheel, and some markings may become distorted on stretch fabrics. If these problems occur, another method of marking should be used.

Tailor's Chalk. Tailor's chalk can be used on most fabrics. It is sometimes used to mark thick fabrics such as corduroy. Tailor's chalk leaves a thicker line than dressmaker's carbon paper and is less accurate. Only the wrong sides of fabric should be marked with tailor's chalk. Chalk markings sometimes are easily removed from some fabrics. Therefore, fabric marked with chalk should be handled carefully until the garment is completed.

Instructions for marking fabric with tailor's chalk are as follows:

- Unpin the pattern piece in the area to be marked. Leave other pins in place.
- Push pins through the pattern and fabric at each symbol to be marked.
- Lift up the pattern piece and mark at the site of each pin if the right sides of the fabric are together. If the wrong sides of the fabric are together, lift up the pattern piece and the top layer of fabric and mark at the site of each pin.
- Turn the fabric and pattern piece over and mark the other layer of fabric.
- Remove the pins and pin the pattern piece in place.



Wrong Sides of Fabric Together **Right Sides of Fabric Together**

Figure 18.5

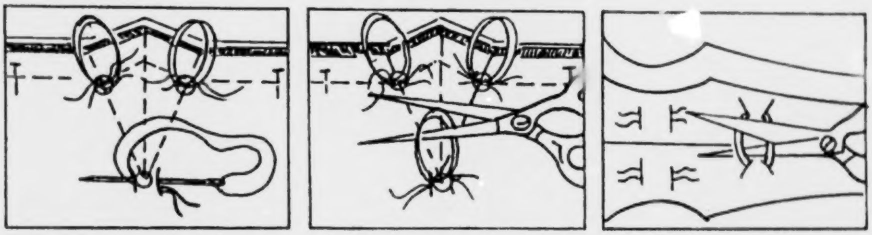
Tailor's wax, a dressmaker's marking pen, or a dressmaker's marking pencil also can be used for this marking method. Figure 18.5 shows the use of tailor's chalk.

Tailor's Tacks. A ***tailor's tack*** is a loose, hand-sewn thread loop that is used to transfer pattern symbols to fabric. Tailor's tacks can be used to mark very thick fabrics, rough fabrics, sheer fabrics, loosely woven fabrics, or any fabric that cannot be marked clearly with other marking tools.

Guidelines for marking fabric with tailor's tacks are as follows:

- Do not unpin the pattern piece.
- Thread a needle with a double thickness of thread. Do not tie a knot in the thread.
- Make a loose stitch through the pattern piece and both layers of fabric at the selected pattern symbol.
- Leave at least 1 inch of thread extending from the pattern.
- Make a second loose stitch over the first stitch. Form about a 1 inch loop.
- Move from one marking to another when marking a series of dots, such as for a dart.
- Clip the thread loops on top of the pattern piece.
- Pull the fabric layers apart gently and clip the threads between the two layers.
- Remove the tailor's tacks when the markings are no longer needed.

This procedure can be followed when the right sides of the fabric are together and when the wrong sides of the fabric are together. Tailor's tacks are illustrated in figure 18.6, and they are also discussed in Chapter Thirteen.



Stitch through pattern and fabric at pattern symbol.

Clip thread loops.

Clip threads between fabric layers.

Figure 18.6

Essential Questions: Coordination of Pattern and Fabric

1. Why should fabric be preshrunk and straightened before pattern pieces are cut?
2. How can the straightness of fabric be determined?
3. How can off-grain fabric be straightened?
4. Why is it important to follow the cutting layout directions on the pattern guide sheet when folding fabric and laying out pattern pieces?
5. Why do pattern layouts for special fabrics differ from standard pattern layouts?
6. How should pattern pieces be pinned to the fabric?
7. What guidelines should be observed when cutting out a garment?
8. What are three common methods used to transfer construction markings to the fabric? When might each method be used?

BASIC CONSTRUCTION TECHNIQUES

Basic construction techniques must be understood in order to construct garments according to the unit method of construction. Basic elements of construction include the following:

- backstitching
- basting
- buttonholes
- casings
- collars
- corners
- darts
- facings
- fasteners
- hand stitches
- hems
- inserts
- interfacing
- linings
- pleats and tucks
- pockets
- points
- seam finishes
- seams
- sleeves
- staystitching
- topstitching
- understitching
- waistbands
- zippers

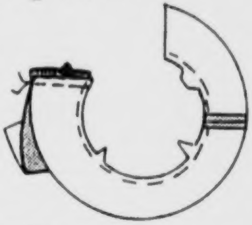
Backstitching, basting, corners, darts, fasteners, hand stitches, inserts, pleats and tucks, points, seams, seam finishes, staystitching, topstitching, and understitching are discussed in Chapter Thirteen.

Facings

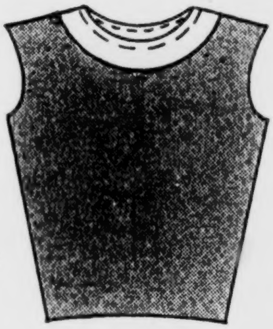
A ***facing*** is a piece of fabric that finishes a raw garment edge, such as an armhole or neckline. A facing may be a fitted facing or a self-facing. A ***fitted facing*** is made of a separate piece of fabric that is cut the same shape as the area being faced. A fitted facing is sewn to the outer edge of the garment and turned in to finish the edge of the garment piece. A ***self-facing*** is cut in one piece with the garment piece and turned to the inside of a garment for a smooth finish. A facing should not be visible from the outside of the garment. Pattern pieces for constructing facings are usually included in the pattern envelope.

The following procedure can be used to construct a fitted facing:

- Staystitch the curved edges of the facing pieces.
- Pin the pieces of the facing with the rights sides together. Match notches.
- Stitch the seams of the facing. Trim and press seams open.
- Finish the outside edge of the facing by stitching or pinking.



After a facing is constructed, it is attached to the garment. A facing can be attached as follows:



- Pin the facing to the garment edge with the right sides together. For a self-facing, turn the facing to the outside of the garment with right sides together. Match notches.
- Stitch seams. Trim and grade the seam allowances. Notch or clip curved areas and trim corners close to the stitching.
- Press open the seam allowance. Press seam toward the facing.
- Turn the facing to the inside of the garment.
- Press along the seam line. Roll the seam toward the facing side.
- Understitch the seam to keep facing positioned inside the garment.

Interfacing

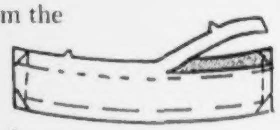
As discussed in Chapter Twelve, interfacing is a piece of shaping fabric used to shape a section of a garment. Interfacing is placed between the facing and the garment to add firmness to an area and help an area retain its shape. Interfacing is used along garment edges, in collars, in cuffs, in waistbands, and in pockets. Interfacing should give support and body without changing the hand of the garment fabric.

A variety of interfacing is available. Interfacing may be knitted, woven, or nonwoven; light, medium, or heavy in weight; and fusible or nonfusible. Interfacing that is woven or knitted should be cut on the same grain line as the facing and the garment. Nonwoven interfacing does not have a grain line. Therefore, it may be cut to make the best use of the interfacing fabric. Fusible interfacing has heat-activated adhesive on one side that is activated when ironed. The heat from the iron melts the adhesive and adheres the interfacing to the garment. Nonfusible interfacing does not contain adhesive and must be stitched to the garment.

Interfacing should be chosen according to the weight of the garment fabric. In addition, interfacing should have the same care instructions as the garment fabric. If the garment fabric is washable, the interfacing should be washable. Information regarding the correct type of interfacing is usually included on the pattern envelope. However, if the pattern envelope does not provide adequate information, interfacing that is lighter in weight than the garment fabric should be used.

Patterns sometimes include separate pattern pieces for interfacing. If separate pattern pieces are not included for interfacing, the facing pattern pieces can be used. The following procedure can be used to attach nonfusible interfacing to a garment piece or facing piece:

- Trim the corners of the interfacing to eliminate bulky corners when the garment is turned right side out.
- Pin the interfacing to the wrong side of the garment piece or facing. Match notches and other markings.



- Stitch 1/2 inch from the garment or facing edge. Do not machine stitch along a folded edge. Catchstitch the interfacing to the garment or facing along a folded edge. Stitches should not show on the outside of the garment.
- Trim the interfacing close to the machine stitching.

Before attaching fusible interfacing, the interfacing should be tested on a scrap piece of the garment fabric. If the interfacing leaves an outline on the fabric or the texture of the fabric surface changes, the interfacing should be fused to the facing rather than to the garment. Fusible interfacing can be attached to a garment piece or facing piece as follows:

- Cut away all seam allowances on the interfacing.
- Place the adhesive side of the interfacing against the wrong side of the garment piece or facing piece.
- Fuse according to the manufacturer's instructions.

Linings

As discussed in Chapter Twelve, a lining adds shape and wear to a garment and provides a finished look inside the garment. Lining also helps to prevent stretching and wrinkling of the outer garment. Lining fabrics are usually firmly woven with a smooth, slippery texture. The weight, color, and care of the lining fabric should be compatible with that of the garment fabric.

A lining is constructed separately from the garment and is then attached to the garment. The garment pattern pieces are often used to cut the lining. However, some patterns, such as jackets and coats, include separate pattern pieces for the lining. Lining pieces should be stitched together according to directions on the pattern guide sheet. It is not necessary to finish the seams of a lining unless the lining fabric will ravel easily.

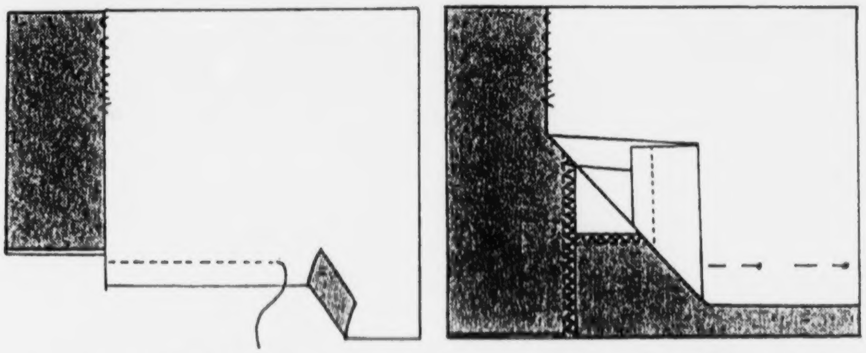
A lining may be free hanging or attached. A ***free-hanging lining*** is not attached to the garment at the hem. It is hemmed separately from the garment and hangs freely in garments such as skirts and pants. An ***attached lining*** is sewn to the garment hem. Attached linings are often used in jackets, sleeves, and pants.

A free-hanging lining can be constructed and attached as follows:

- Machine stitch darts and lining seams as they are in the garment.
- Join lining pieces. Leave the zipper area open.
- Press all seams and darts.
- Turn the lining right side out.
- Match the lining to the garment with wrong sides together and pin at the waistline.
- Turn under the seam allowances at the zipper opening. Match the folded edges to the zipper tapes and pin.
- Baste the lining to the garment 1/2 inch from the waistline edge.
- Attach the waistband and slipstitch the lining to the zipper tapes.
- Hem the lining and the garment separately. Make the hem of the lining 1 inch shorter than the hem of the garment. Ease the edge of the lining hem if necessary.
- Attach the lining to the garment with French tacks 1 inch long. Place one French tack at each seam.
- Slipstitch the remaining lining edge to the facing if the garment has a faced opening.

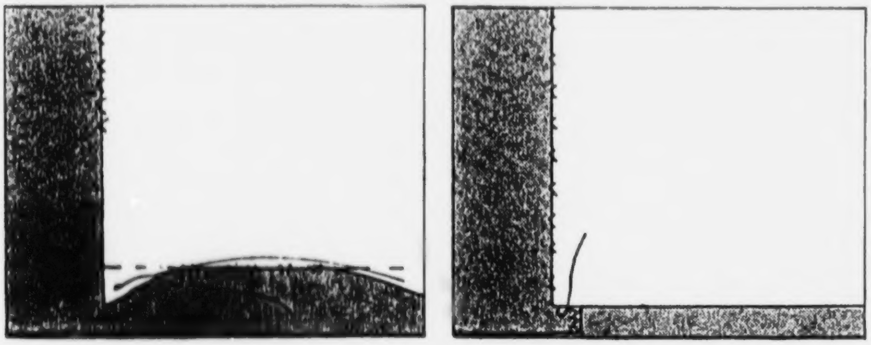
The following procedure can be used to attach a lining to a hem:

- Hem the garment.
- Place the lining in the garment with wrong sides together and pin.
- Sew the lining in place except for 6 inches at the lower edge.



Sew lining in place, trim, and easestitch.

Fold lining under and pin.



Slipstitch edge of lining to garment hem.

Slipstitch remaining lining edge.

Figure 18.7

- Trim the lining to 5/8 inch below the garment edge. Easestitch 1/2 inch from the hem edge if the lining hem must be eased.
- Fold the lining under until the fold is 1/2 inch from the garment edge.
- Pin the lining to the garment 1/2 inch above and parallel to the fold.
- Fold the lining back along the pinned line and slipstitch the edge of the lining to the garment hem.
- Slipstitch the remaining lining edge to the facing if the garment has a faced opening.

Once the lining is attached to the hem, the lining will form a pleat at the hemline. This pleat provides room for movement. Figure 18.7 illustrates the procedure for attaching a lining to a hem.

Seams

As described in Chapter Thirteen, a seam is a row or rows of stitching that hold(s) two or more layers of fabric together. Two types of basic seams are the gathered seam and the eased seam. Gathered and eased seams are used when two seam edges of unequal lengths are sewn together. Additional types of seams as well as seam finishes are discussed in Chapter Thirteen.

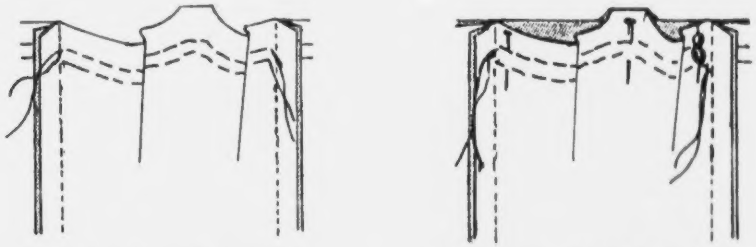
Gathered Seams. A ***gathered seam*** is formed when the edge of a long fabric piece is gathered up to match the second edge of a shorter piece of fabric, and the fabrics are then sewn together. Soft, even folds are created by gathering. Fabric is usually gathered to one-half or one-third its original width.

Gathering is often used on garments at the waistline, yoke, or cuffs, and it can also be used to create ruffles.

Gathering is done after construction seams are stitched, finished, and pressed. Gathers are formed by pulling the bobbin thread and sliding the fabric along the thread. When stitched properly, a gathered seam retains fullness. The following procedure can be used to make gathers:

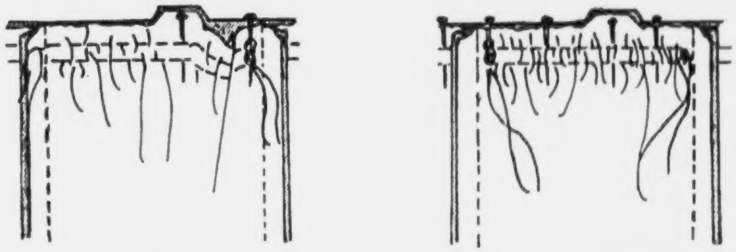
- Stitch two parallel rows in the seam allowance on the right side of the fabric requiring gathering. Leave long thread ends. Break the stitching at seams since it is difficult to gather through two thicknesses.
- Pin the stitched fabric edge to the corresponding straight fabric edge with right sides together. Match notches, center lines, and seams.
- Secure the bobbin threads at one end by wrapping around a pin in a figure-eight.
- Pull on the bobbin threads gently while sliding the fabric along the threads to gather half the section.
- Secure the bobbin threads around a pin once uniform gathers are created and the gathered section fits the adjoining edge of fabric.
- Untie the bobbin threads and repeat the gathering process on the ungathered section of fabric.
- Adjust gathers uniformly and pin at frequent intervals once the entire gathered edge matches the straight edge.
- Stitch along the seam line with the gathered side up. Use both hands to hold the gathers evenly on both sides of the needle to prevent folds or pleats from forming.

Figure 18.8 illustrates this procedure for gathering a seam.



Stitch two parallel rows on the right side of the fabric.

Pin fabric with right sides together and secure bobbin threads around a pin.



Pull on the bobbin threads and slide the fabric along the threads.

Adjust gathers uniformly and pin at frequent intervals.

Figure 18.8

Eased Seams. An ***eased seam*** is used to join the edges of two plies of fabric that are slightly different in length without forming gathers. The extra length is eased so that puckers and gathers are not created. Easing is used to shape fabric over curved areas of the body, such as sleeves, shoulder seams, waistbands, and yokes. Eased seams are often used to attach set-in sleeves. When stitched properly, an eased seam has subtle shaping and is smooth and unpuckered.

A seam can be eased as follows:

- Pin the right sides of the fabric together with the longer piece on top. Pin at each seam and at the notches.
- Place a pin halfway between the pins at the notches.
- Spread the extra fabric equally on each side of each pin. Place additional pins halfway between these pins.
- Continue pinning until pins are about 1/2 inch apart.
- Stitch with the longer seam on top.

The procedure for gathering a seam can be followed when a greater amount of fullness must be eased.

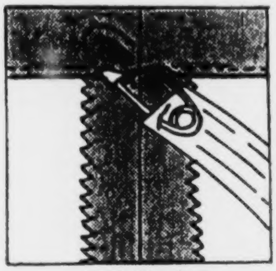
Casings

A ***casing*** is a fabric tunnel that holds elastic or a drawstring in place. Casings are used on waistlines, necklines, sleeves, and hemlines to help control fullness.

The elastic or drawstring allows the garment to be adjusted. There are two types of casings. A ***self-casing*** is formed by folding the edge of a garment over and stitching it into place. Self-casings are the easiest type of casing to make and use. An ***applied casing*** is formed by sewing a separate piece of fabric to the edge of a garment or within a garment. Single-fold bias tape can also be used to construct an applied casing. An applied casing is usually attached to the inside of a garment, but it is sometimes attached to the outside of a garment for decorative purposes. Applied casings are suitable for garments made of bulky fabrics. To allow for ease of movement, both types of casings should be about 1/4 inch wider than the drawstring or elastic that will be enclosed.

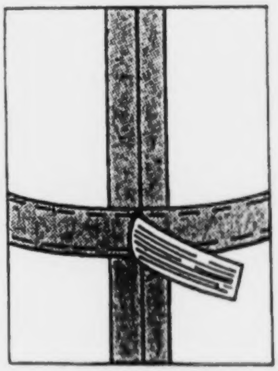
A self-casing can be constructed as follows:

- Fold the raw edge of the fabric under 1/4 inch and press.
- Fold the casing to the inside of the garment along the fold line. Press and pin in place.
- Edgestitch along the pinned edge. Leave a 2 inch opening unstitched at the side seam or center back to insert the elastic.
- Cut elastic to the correct length. Measure the body at the point where the casing will fit and add 1 inch to determine the length to cut the elastic.
- Pull the elastic through the casing using a safety pin or bodkin. A bodkin is a blunt, needle-like tool used to pull material or elastic through a casing.
- Overlap the ends of the elastic 1 inch and pin together.
- Check the fit of the garment and adjust the elastic if necessary.
- Stitch the ends of the elastic together.
- Stitch the casing closed. Stretch the elastic while stitching.



Self-Casing

A procedure such as the following can be used to construct an applied casing:



Applied Casing within Garment

- Cut a strip of fabric 1/2 inch longer than the finished casing length and 1 inch wider than the width of the elastic.
- Fold in the edges of the fabric 1/4 inch and press.
- Edgestitch the folded ends.
- Pin the casing in place on the garment.
- Edgestitch along the edge of the casing. Leave a 2 inch opening unstitched at the side seam or center back to insert the elastic.
- Insert the elastic as described above.
- Stitch the casing closed.

The procedures for constructing drawstring casings are basically the same as the procedures for constructing elastic casings. The main difference is that an opening must be left in the casing for the drawstring. The opening for a drawstring can be on the outside or the inside of a garment. The opening can be two buttonholes or a slit in a seam. The opening should be reinforced with fusible interfacing or a small piece of fabric.

Buttonhole openings should be constructed in the outer fabric before the casing is stitched. A seam opening is made as the seam is stitched. The seam should be left open between markings and reinforced with backstitching. A safety pin can be used to pull the drawstring through the casing. The ends of the drawstring should be knotted so the drawstring will not come out during washing or wearing.

Hems

A ***hem*** is a finish made by folding the fabric of a garment to a desired length to finish the bottom edges of shirts, sleeves, dresses, skirts, jackets, and pants. When a garment is hemmed properly, the stitches should not show on the outside of the garment, the hem edge should be smooth and flat, and the garment should hang evenly on the body. In some cases, the hem will show on the outside of the garment if it is part of the garment design.

Most hems are made by turning the raw edge of the fabric to the inside of the garment and stitching or fusing it in place. Before a hem can be stitched, however, it must be marked and turned up. A hem length should be chosen that is appropriate for the client's body build and current fashion trends. The client should put on the garment and stand straight with weight on both feet. Clothing and accessories that will be worn with the completed garment should be worn when the hem is marked.

Before the hem is marked, the garment should hang on a hanger for twenty-four hours. Hanging allows any bias areas of the garment to stretch and prevents the finished hemline from sagging. Procedures for marking the hems of different types of garments are as follows:

- dresses and skirts - Use a ruler, yardstick, or skirt marker to measure the distance from the floor to the desired finished hem length. Place chalk marks or pins in the garment parallel to the floor. Chalk marks or pins should be about 2 to 3 inches apart.
- pants and slacks - Fold one pants leg under until the length touches the top of the shoe in the front and pin. The back should be about 1/2 inch longer than the front.
- jackets - Fold the fabric under and pin according to the hemline marked on the pattern. Adjust as needed.
- sleeves - Have the client bend the arm so that the hand is at the center of the waistline. Fold the edge of the sleeve under until it covers the wrist bone and pin.

Figure 18.9 shows examples of how to mark hems on different types of garments.

After the hem is marked, it should be turned up and trimmed. Hems are often trimmed to 2 to 3 inches in depth. This depth adds to the weight of the hemline and helps it to fall evenly. When determining the width of a hem, the weight of the fabric and the flare of the garment should be considered. Hems can be turned up and trimmed as follows:

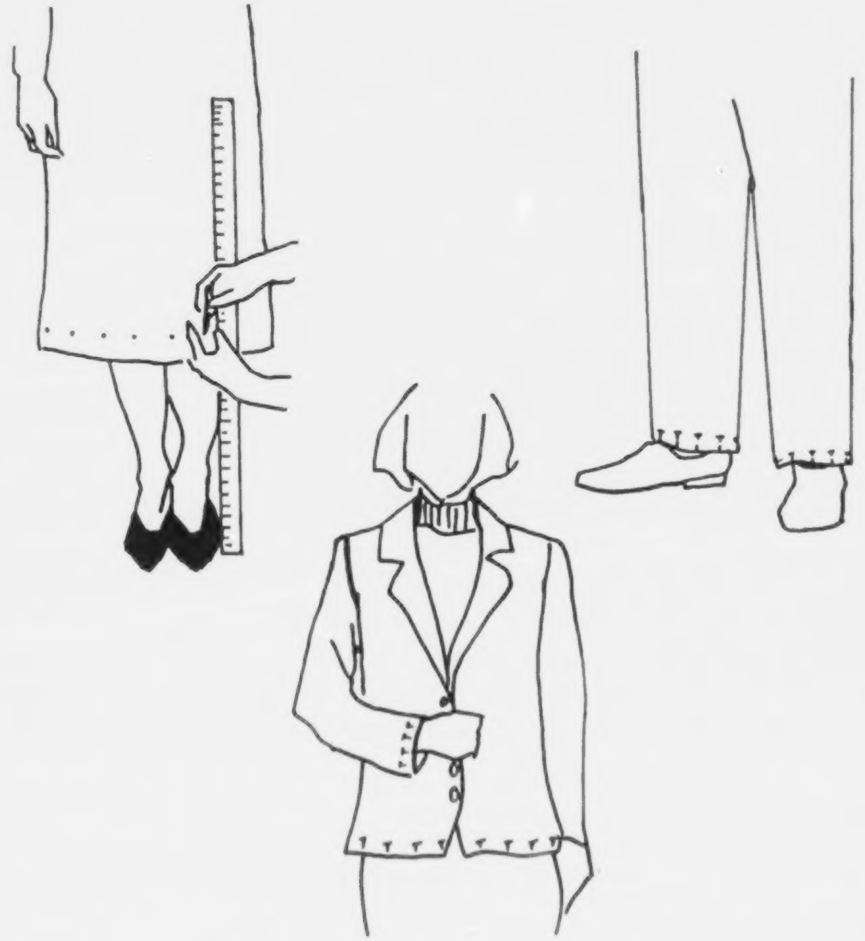
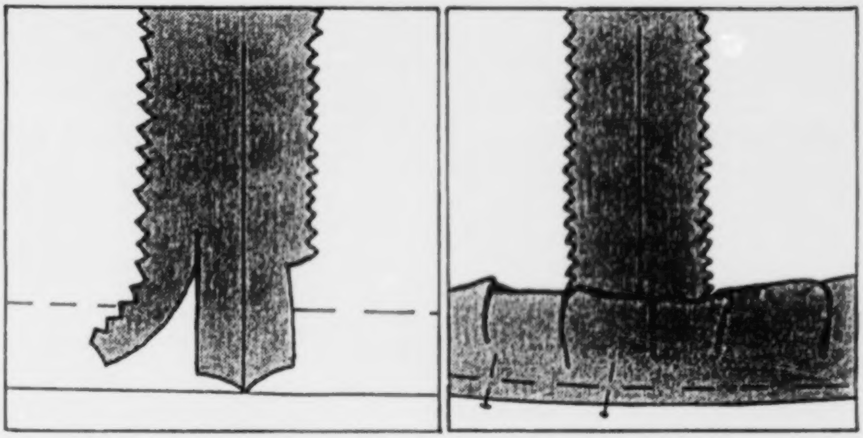


Figure 18.9

- Trim each seam allowance to half the original width to reduce bulk within the hem allowance. Trim the seam allowances from the edge of the garment to the marked hemline.
- Fold the hem up along the marked line. Pin close to the folded edge with pins at right angles to the fold. Ease extra fullness if necessary so the hem will fit flat against the garment.
- Hand baste about 1/4 inch from the folded edge around the entire hem. Remove pins.
- Determine how deep the hem should be. Curved edges usually have a narrower hem width than straight edges.
- Use a hem gauge or ruler to measure the width of the desired hem. Use pins or tailor's chalk to mark the hem width.
- Trim the excess hem allowance along the marked line.

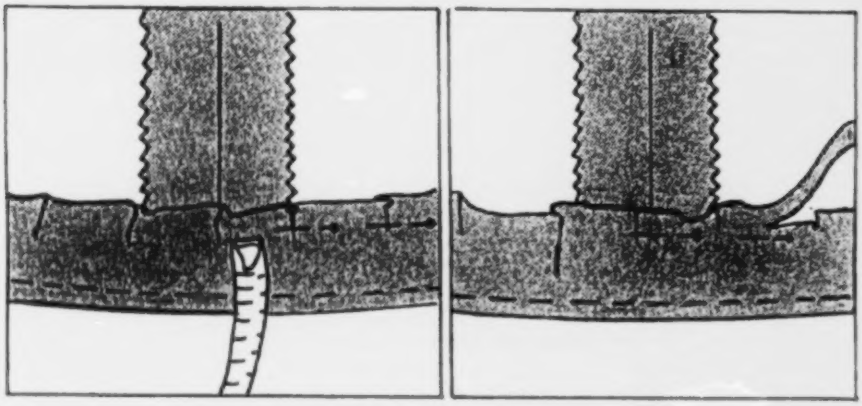
Figure 18.10 illustrates the procedure for turning up and trimming a hem.

After the hem has been turned up, trimmed, and eased (if necessary), it should be finished before being stitched to the garment. A ***hem finish*** is a treatment applied to the raw edge of the fabric to keep the fabric from raveling and provide support for the hemming stitches. Finishes used for seams can also be used to finish hems. The zigzag seam finish, pinked and stitched seam finish,



Trim seam allowance to half of original width.

Fold hem, pin, and baste.



Measure and mark desired width of hem.

Trim excess hem allowance.

Figure 18.10

and clean finish can be used to finish hems. These seam finishes are described in Chapter Thirteen.

The seam tape finish is often used to finish hems. A ***seam tape finish*** is made by stitching seam tape, bias tape, or lace to the raw edge of the hem. This type of finish is suitable for straight hems on medium-weight to heavyweight woven fabrics. A seam tape finish is produced by placing the tape 1/4 inch over the raw edge of the hem and stitching.

A hem can be attached to a garment by machine, by fusing, or by hand. The pattern guide sheet should be referred to when determining the type of hem to use. Machine stitching is often used to hem the bottom of shirts and blouses. Machine stitching also can be used for both decorative and invisible stitching. Some sewing machines have a built-in blindstitch for hemming. ***Fusing*** is the process of placing fusible web between the garment and the hem and pressing. The fusible web melts when heated and adheres the hem to the fabric. A fused hem can be altered by pressing the hem with steam until the fabric layers can gently be pulled apart.

Most hems are sewn by hand. The catchstitch, slipstitch, vertical hemming stitch, or blind hemming stitch can be used to attach a hem to a garment. These stitches are explained in Chapter Thirteen.

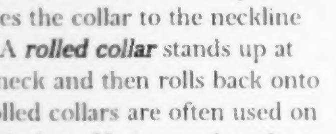
Collars

As discussed in Chapter Nine, a collar is a piece of fabric attached to the neckline of a garment. A collar serves as a frame for the face and directs the eye toward the face. Collars are usually flat, standing, shirt, or rolled and made of two layers of fabric and one layer of interfacing to help them keep their shape.

A ***flat collar*** lies flat against the garment when attached. Flat collars may have pointed corners or rounded edges. A ***standing collar*** is made of a band that stands straight up. A standing collar may fold over to create a turtleneck. A ***shirt collar*** contains a separate band that attaches the collar to the neckline of the garment. A ***rolled collar*** stands up at the back of the neck and then rolls back onto the garment. Rolled collars are often used on blouses and suit jackets. Various styles of collars are illustrated in Chapter Nine.

The following basic procedure can be used to construct many collar styles:

- Stitch or fuse interfacing to the collar facing or the under collar. Refer to the section on interfacing included in this chapter.
- Pin the collar pieces with right sides together or the collar and the facing pieces with right sides together. Follow the instructions on the pattern guide sheet.
- Stitch the outer edge of the collar. Reinforce points or corners.
- Trim and grade the seam allowances. Notch or clip curved areas and trim corners close to the stitching to form sharp points.

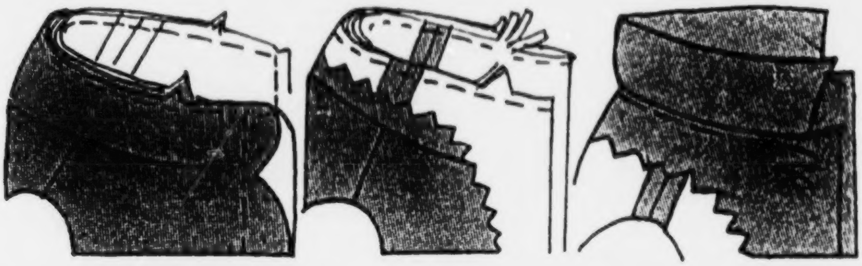


- Press the seam open and turn the collar to the right side. Pull points out gently.
- Press the outer seam of the collar and roll it slightly to the collar underside.
- Understitch the undercollar to the seam allowance or topstitch around the edge of the collar.

After a collar is constructed, it must be attached to the garment. There are different methods of attaching collars to garments. The method used depends on the type of collar and whether the garment has a neck facing. The following method can be used to attach a collar with a neck facing; however, the instructions on the pattern guide sheet usually should be followed when attaching collars to garments:

- Stitch facing sections together and complete facing construction. Refer to the section on facings included in this chapter.
- Staystitch the neckline of the garment. Clip the neck edge up to the staystitching.
- Machine baste the neckline edge of the upper and the under collar together.
- Place the collar underside against the right side of the garment. Pin the collar to the neckline. Match notches and markings.
- Stitch inside the seam line in the seam allowance.
- Pin the facing to the neckline with the right side of the facing and the right side of the collar together. Match seam lines and markings.
- Stitch through all layers of the collar, neckline, and facing. Trim, grade, and clip the seam allowances.
- Turn the facing to the inside of the garment and press.
- Understitch the facing to the neckline seam allowances.
- Tack the edge of the facing to the shoulder seam allowances.

An example of this procedure is included in figure 18.11.



Pin collar to neckline with collar underside against right side of garment.

Stitch facing and collar to neckline.

Turn facing to the inside, understitch, and tack in place.

Figure 18.11

Collars without neck facings can be attached as follows:

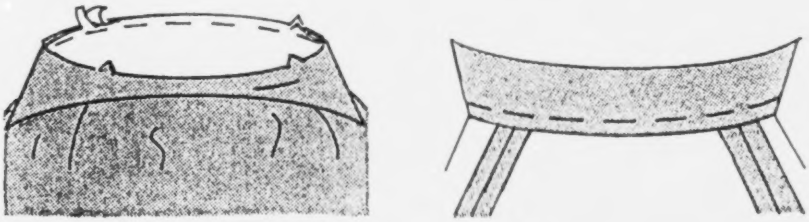
- Staystitch the neckline of the garment. Clip the neck edge up to the staystitching.
- Place the right side of the under collar against the right side of the garment. Pin the collar to the neckline. Match notches and markings.
- Stitch the under collar to the garment. Trim, clip, and press the seam toward the collar.
- Turn in the seam allowance of the upper collar or band. Press and trim the seam allowance to 1/4 inch.
- Pin the folded edge over the neckline seam and slipstitch by hand or machine stitch close to the edge.
- Press the seam and the collar at the neck edge.

Figure 18.12 shows an example of this procedure.

Sleeves

As discussed in Chapter Nine, there are three basic types of sleeves: kimono, raglan, and set-in. Each of these sleeve styles has a different look and method of construction. The kimono sleeve is cut in one piece with the front and the back of the garment. The raglan sleeve is cut separately and attached to the garment by a diagonal seam that extends from the armhole to the neckline. The set-in sleeve is constructed separately and attached to the armhole of the garment.

Kimono Sleeves. The kimono sleeve extends from the front and back of the garment without armhole seams. When constructing a kimono sleeve, it is important to clip and reinforce the underarm area. Since a sharp curve is formed by the underarm seam, the seam must be clipped so it will



Place right side of under collar against right side of garment, pin, and stitch.

Turn in seam allowance of upper collar, pin over neckline seam, and stitch.

Figure 18.12

lie flat. Extra stress is placed on the underarm area when the garment is worn. Therefore, the clipped underarm area must be reinforced so the stitches do not break.

A kimono sleeve can be constructed as follows:

- Pin the front and back pieces of the garment with right sides together.
- Stitch the shoulder seam and press open.
- Stitch the underarm seam.
- Reinforce the underarm seam with a second row of stitching 3/8 inch from the outer edge or stitch a piece of seam tape over the underarm seam.
- Clip along the curve of the seam as close as necessary. Press the seam open.

Raglan Sleeves. A raglan sleeve is attached to a garment by a continuous diagonal seam that runs down from the front neckline to the underarm, and up to the back neckline. Since a raglan sleeve covers the entire shoulder, a shaping device such as a dart is included at the top of the sleeve to help the sleeve fit over the curve of the shoulder.

A procedure for constructing a raglan sleeve is as follows:

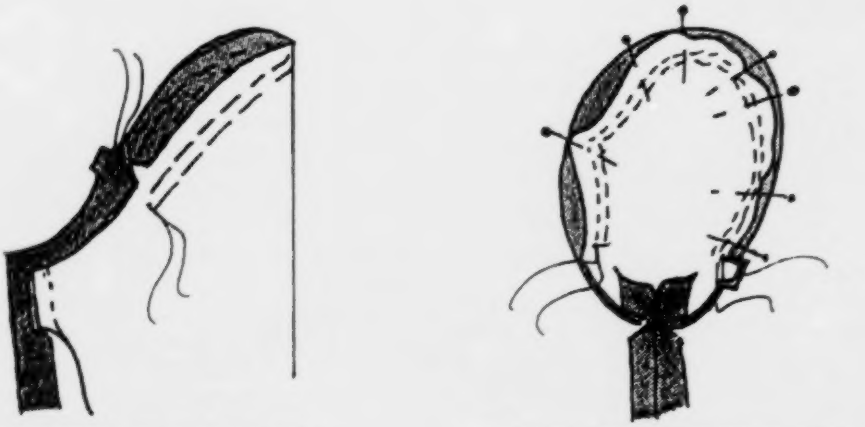
- Stitch the shoulder dart on the sleeve. Slash the dart and press open.
- Pin the diagonal seams on the sleeve to the garment with right sides together. Match notches, markings, and underarm seams.
- Stitch the diagonal seams.
- Reinforce the seams by stitching the underarm area 3/8 inch from the outer edge.
- Clip inside curves and notch outside curves. Press seams open.
- Stitch the side seam of the garment and the underarm seam of the sleeve.

Set-In Sleeves. Set-in sleeves are commonly used in garments, but they are more difficult to construct than kimono or raglan sleeves. A set-in sleeve is attached to a garment at the armhole. A set-in sleeve is always larger than the armhole of the garment. This extra fullness allows the sleeve to fit over the top curve of the arm and provides movement. For garments designed to be smooth at the seam line, the extra fullness of the sleeve must be eased into the armhole without gathers or puckers forming. Sleeves that are not designed to be smooth at the seam line, such as a puffed sleeve, may be gathered at the seam line. The gathers should be even along the upper curve.

A set-in sleeve can be constructed and attached as follows:

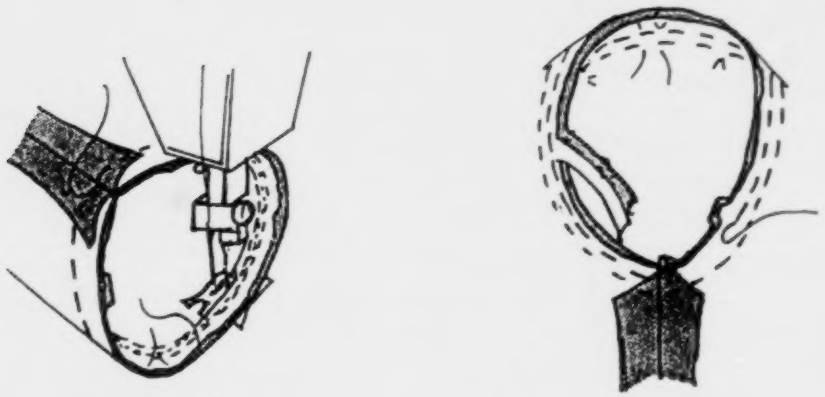
- Easestitch between the notches on the sleeve cap 5/8 inch from the edge.
- Easestitch a second row 3/8 inch from the edge.
- Pin the sleeve with right sides together and stitch the underarm seam. Press the seam open.
- Insert the sleeve into the armhole with right sides together. Pin at matched markings.
- Draw up sleeve fullness by pulling the bobbin thread ends. Distribute fullness evenly along the sleeve cap.
- Pin sleeve to armhole at 1/2 inch intervals. Hand baste using small stitches.
- Examine the right side of the sleeve for puckers. If puckers appear, remove the basting and place the sleeve over a press mitt or tailor's ham. Press along the sleeve cap on the right side and shrink out as much puckering as possible.
- Place the sleeve in the armhole and baste.
- Begin stitching the sleeve to the armhole at the underarm seam with the sleeve side up.
- Trim the cross seam allowances diagonally at the shoulder and underarm.
- Stitch a second row within the seam allowance 1/4 inch from the first row of stitches.
- Trim seam allowances close to the second row of stitching.
- Turn seam allowances toward the sleeve.

This procedure for constructing and attaching a set-in sleeve is illustrated in figure 18.13.



Easestitch two rows between the notches on the sleeve cap.

Insert the sleeve into the armhole and pin at matched markings and draw up fullness.



Stitch the sleeve to the armhole beginning at the underarm seam.

Trim seam allowances.

Figure 18.13

Sleeve Finishes. The method in which the edge of a sleeve is completed is known as the ***sleeve finish***. There are several types of sleeve finishes that range from simple hems to cuffs. Regardless of the type of sleeve finish, the hemline of the sleeve should be marked at a length that is attractive on the wearer, pressing should be accurate, and bulk should be reduced wherever possible.

Common types of sleeve finishes include the fold-up cuff, the band cuff, and the buttoned cuff. The ***fold-up cuff*** is made of a deep hem that is folded to the right side of the garment and tacked in place at each seam. The fold-up cuff does not require a placket or a fastener. ***The band cuff*** is formed by stitching an interfaced band to the edge of the sleeve. Since the band cuff fits the wrist closely, the opening must be large enough for the hand to slip through. A ***buttoned cuff*** fits snugly around the wrist and is made with a placket that is secured with a fastener, such as a button. As discussed in Chapter Thirteen, a placket is a partial opening in a garment in an area such as the neckline, waistline, or sleeve. The placket provides additional space for movement of the hand and arm through the cuff.

Waistbands

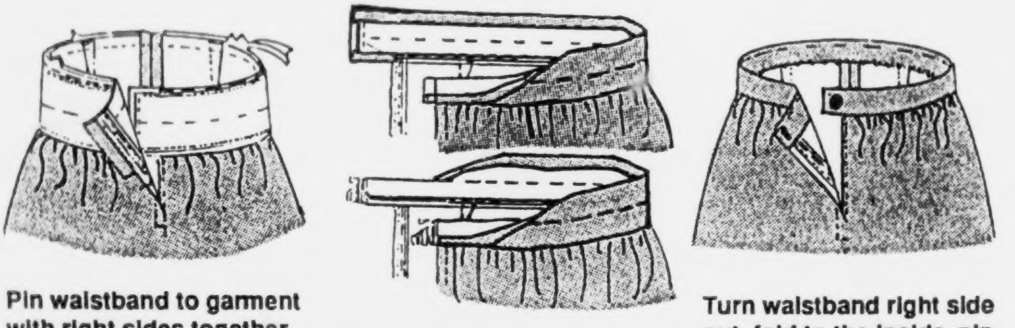
A ***waistband*** is a band of fabric attached to the waistline of skirts, pants and slacks, and shorts. A waistband usually has one end that laps over the other end so that a fastener can be applied to keep the waistband closed. The ***overlap*** is the end of the waistband that falls on the top, and the underlap is the end of the waistband that falls underneath the overlap.

A waistband may be attached to a garment in many different ways. On many garments, the waistband is attached in one piece after the zipper is attached and all other vertical seams are stitched. On some men's and boy's garments, the waistband is attached in two pieces. The center back seam is left open and a waistband piece is attached to each half of the garment. After the waistband pieces are attached, the center back seam is stitched. Since the methods for attaching waistbands differ, directions on the pattern guide sheet should be followed.

The plain waistband and topstitched waistband are two common types of waistbands. A ***plain waistband*** is stitched to the right side of the garment and turned to the inside and stitched. A ***topstitched waistband*** is stitched to the wrong side of the garment and turned to the outside and topstitched in place. A plain waistband can be constructed as follows:

- Interface the waistband if the fabric is lightweight.
- Press the unnotched fabric edge under 1/2 inch. Trim the seam allowance to 1/4 inch on this unnotched edge.
- Pin the waistband to the garment with right sides together. Match notches. Ease the garment to the waistband between markings.
- Stitch the waistband to the garment.
- Trim interfacing close to stitching and trim and grade seam allowances. Press the seam flat and then toward the waistband.
- Fold each end of the waistband along the fold line with right sides together and pin.
- Stitch each end. Trim and grade seam allowances, clip corners, and press.
- Turn the waistband right side out. Fold to the inside along the fold line and pin over the seam.
- Slipstitch the waistband in place.
- Attach fasteners.

Figure 18.14 illustrates the procedure for constructing a plain waistband.



Pin waistband to garment with right sides together and stitch.

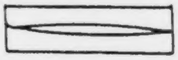
Fold each end of the waistband along the fold line with right sides together, pin, and stitch. Trim and grade seam allowances.

Turn waistband right side out, fold to the inside, pin, and slipstitch in place.

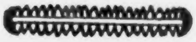
Figure 18.14

Buttonholes

A ***buttonhole*** is a slit or loop through which a button can be fastened. Buttonholes may be bound or worked. A ***bound buttonhole*** is made of fabric strips that are cut and sewn into place before the facing is attached. Bound buttonholes are often used on tailored jackets and coats. A ***worked buttonhole*** consists of stitches around the edges of the buttonhole area. Worked buttonholes are constructed after a garment is completed, and they may be machine-worked or hand-worked.


Bound Buttonhole

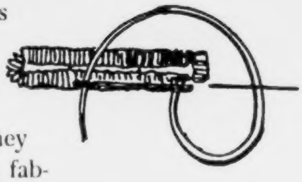
A ***machine-worked buttonhole*** is often stitched with a zigzag machine stitch. Machine-worked buttonholes are suitable for firmly woven or knitted fabrics that are medium-light to medium-heavy in weight. Machine-worked buttonholes should not be used on fabrics that are very lightweight or on heavy, loosely woven fabrics that may fray.

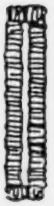

Machine-Worked Buttonhole

Some sewing machines have a buttonhole attachment that is used to make machine-worked buttonholes. On sewing machines without a buttonhole attachment, the zigzag stitch width is changed to form a machine-worked buttonhole. Machine-worked buttonholes can be constructed as follows:

- Mark the placement of the buttonhole on the right side of the fabric.
- Stitch the buttonhole. Since sewing machines differ, follow the instructions in the sewing machine manual for constructing buttonholes.
- Place one pin across each end of the buttonhole.
- Use small, sharp scissors to cut the buttonhole open. Insert the blade of the scissors in the center of the buttonhole; cut in both directions from the center.

A ***hand-worked buttonhole*** is stitched by hand using the buttonhole stitch as discussed in Chapter Thirteen. Hand-worked buttonholes are not as durable as machine-worked buttonholes, and they are usually used on fabrics on which machine-worked buttonholes are not suitable. Hand-worked buttonholes can be constructed as follows:




Hand-Worked Buttonholes

- Mark the placement of the buttonhole on the right side of the fabric.
- Stitch around the buttonhole 1/8 inch from the buttonhole mark. Round the end of the buttonhole nearest the garment edge when constructing a horizontal buttonhole. Make both ends of the buttonhole square when constructing a vertical or diagonal buttonhole.
- Cut the center of the buttonhole open.
- Overcast the edges of the buttonhole.
- Stitch the buttonhole using the buttonhole stitch. Work from right to left around the opening. Begin stitching at the straight end on a horizontal buttonhole. Begin stitching at either end on a vertical or diagonal buttonhole.
- Make fan-shaped stitches at the rounded end of a horizontal buttonhole. Make a bar tack across the end of a vertical or diagonal buttonhole.
- Continue stitching along the edge of the buttonhole to the end. Make a bar tack across the end of a horizontal, vertical, or diagonal buttonhole.

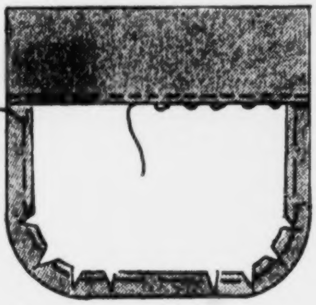
Pockets

A ***pocket*** is a bag or pouch sewn into or on clothing. Pockets may be functional or decorative. There are many types of pockets.

Some pockets are located inside a garment, some are stitched on the outside of a garment, and some may have a flap over the top of the pocket. Two common types of pockets are the patch pocket and the seam pocket.

Patch Pockets. A ***patch pocket*** is a piece of fabric that is sewn to the outside of a garment. A patch pocket may be any shape and may be lined or unlined. Patch pockets may be plain, decorated, made of the same fabric as the garment, or made of contrasting fabric. When the design of a garment calls for a patch pocket, a pattern piece for the pocket is usually included in the pattern envelope.

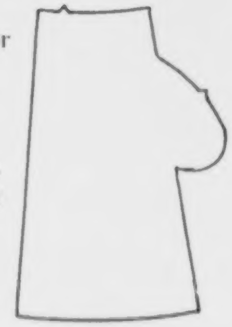
An unlined patch pocket often includes a self-facing at the opening edge. The facing is turned to the inside during construction. Unlined patch pockets can be constructed as follows:



- Turn under and edgestitch the raw edge of the pocket facing.
- Fold the facing to the right side of the pocket along the fold line.
- Stitch each side of the facing on the seam line.
- Trim the seam allowance of the pocket to 3/8 inch. Cut diagonally across each corner at the top of the pocket.
- Turn the facing to the wrong side of the pocket and pull the corners out.
- Press facing and seam allowances. Notch round corners; miter square corners.
- Baste around the edge of the pocket and slipstitch the facing to the pocket.

When construction of a patch pocket is completed, the pocket can be attached to the garment. The pocket should be pinned to the right side of the garment and basted in place. The pocket can be stitched by machine or by hand. Machine stitches should be as close as possible to the edges of the pocket. An uneven slipstitch should be used when sewing the pocket on by hand.

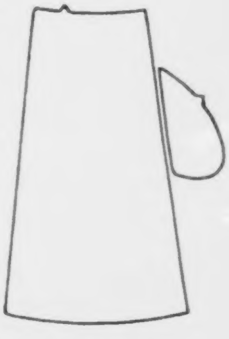
Seam Pockets. A ***seam pocket*** is a pocket sewn into the side seam or side front seam of a garment. Seam pockets are used in skirts, slacks or pants, shorts, and dresses. An ***all-in-one seam pocket*** is cut as part of the garment front and back. A ***separate seam pocket*** is cut from a separate pattern piece and stitched to the side seam of the garment. A separate seam pocket should be constructed from the same fabric as the garment if the garment fabric is lightweight and a solid color. If the garment fabric is heavy or bulky, the pocket pieces should be cut from a lightweight fabric that matches or blends with the garment fabric.



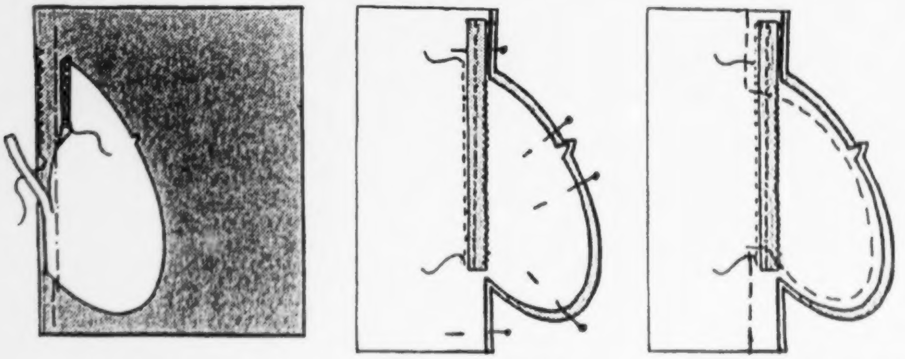
All-In-One Seam Pocket

A separate seam pocket can be constructed as follows:

- Stitch a piece of seam tape along the front and back fold line or seam line of the garment to reinforce the pocket opening.
- Pin one pocket piece to the front garment piece with right sides together. Match markings and stitch.
- Pin the other pocket piece to the back garment piece with right sides together. Match markings and stitch.
- Press seam allowances toward pocket pieces.



Separate Seam Pocket



Pin pocket piece to garment piece and stitch.

Pin garment front to garment back. Baste pocket opening.

Stitch directionally along seam and around pocket.

Figure 18.15

- Pin the garment front to the garment back with right sides together and pockets extended. Match markings.
- Baste the pocket opening.
- Stitch directionally along the seam and around the pocket in one step. Reinforce the corners of the pocket.
- Press seam allowances flat.
- Turn the pocket toward the front of the garment; clip the back seam allowance above and below the pocket. Press the garment seam allowances open.
- Finish seam allowances and remove basting.

Figure 18.15 illustrates the procedure for constructing a seam pocket.

An all-in-one seam pocket can be constructed using the same method as a separate-seam pocket. The only difference is that the pocket pieces do not have to be stitched to the garment front and the garment back since they are cut as part of the garment.

Zippers

As presented in Chapter Thirteen, a zipper is a widely-used fastening device for women's, men's, and children's garments. Conventional, separating, and invisible zippers are available. Information about specific types of zippers and terms related to zippers are included in Chapter Thirteen.

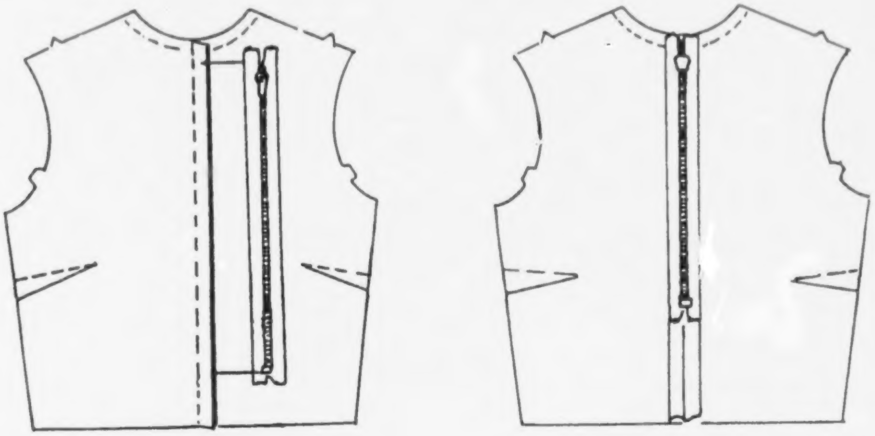
Conventional Zippers. Zippers can be attached to garments in a variety of ways. Zipper application is the method by which a zipper is attached. There are three basic zipper applications for the conventional zipper. A conventional zipper may have a centered zipper application, a lapped zipper application, or a fly-front zipper application.

In a ***centered zipper application***, the zipper is centered in a seam and stitched along each side. The zipper is covered with equal amounts of fabric on either side of the opening. The centered zipper application is often used in the center front and center back openings of garments. A centered zipper application can be completed as follows:

- Measure the zipper and mark the length of the opening on the garment.
- Stitch the seam up to the mark for the bottom of the zipper.
- Baste the seam where the zipper opening will be. Press open.
- Place the closed zipper face down on the pressed open seam allowance. Center the zipper coils or teeth on top of the basted seam.
- Baste the zipper in place.

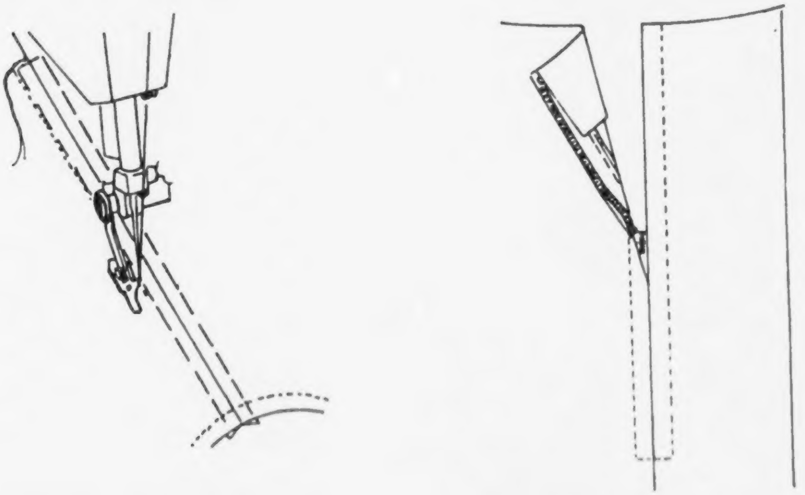
- Turn the garment right side out and press flat. Mark the bottom stop of the zipper with a pin.
- Attach the zipper foot to the sewing machine.
- Position the zipper foot to the left side of the needle and stitch two or three stitches across the bottom of the zipper and pivot and stitch to the top of one side.
- Position the zipper foot to the right side of the needle and stitch the other side of the zipper by stitching two or three stitches across the bottom of the zipper and pivoting and stitching to the top.
- Pull the thread ends to the wrong side of the garment and tie.
- Remove the basting and press.

The centered zipper application described is illustrated in figure 18.16.



Mark length of zipper on garment opening.

Place zipper on seam allowance.



Turn garment right side out and stitch zipper in place.

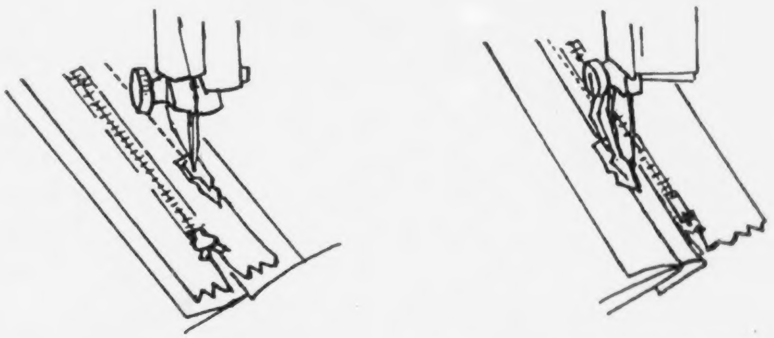
Completed Centered Zipper

Figure 18.16

In a ***lapped zipper application***, only one side of the placket covers the zipper. Only one row of stitching shows on the outside of the garment. The lapped zipper application is often used in center front openings, center back openings, and side openings in garments. The following procedure can be used for a lapped zipper application:

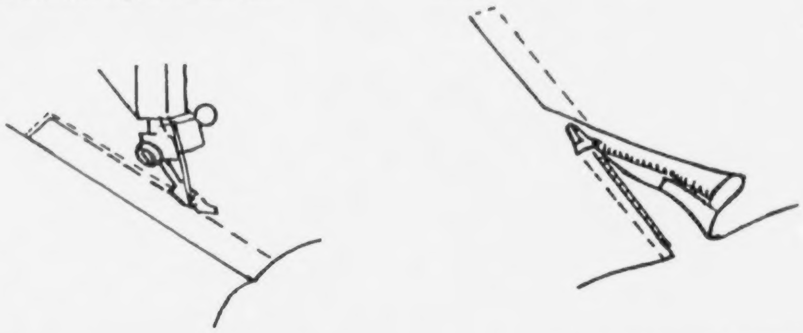
- Measure the zipper and mark the length of the opening on the garment.
- Stitch the seam up to the mark for the bottom of the zipper.
- Baste the seam where the zipper opening will be. Press open.
- Extend the right-hand seam allowance. Center the zipper coils or teeth on top of the basted seam and pin.
- Baste the right-hand side of the zipper in place.
- Turn the zipper face up so a fold forms in the seam allowance. Place the fold close to the zipper coils or teeth and pin.
- Attach the zipper foot to the sewing machine.
- Position the zipper foot to the left of the needle and stitch through all thicknesses along the edge of the fold.
- Turn the garment right side out and flatten the fabric.
- Baste across the bottom of the zipper and along the side to the top.
- Position the zipper foot to the right of the needle and stitch close to the basting across the bottom of the zipper and along the side to the top.
- Pull the thread ends to the wrong side of the garment and tie.
- Remove the basting and press.

The lapped zipper application is illustrated in figure 18.17.



Place the closed zipper face down on the seam allowance and baste on the right-hand side.

Turn the zipper face up so a fold forms in the seam allowance and stitch.



Turn the garment right side out and stitch along the side of the zipper to the top.

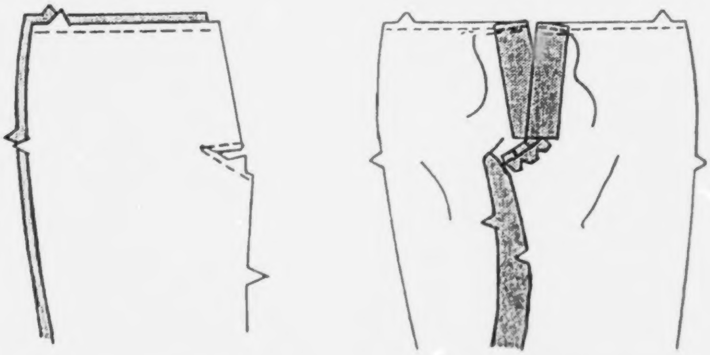
Completed Lapped Zipper

Figure 18.17

A ***fly-front zipper application*** is similar to the lapped zipper application except that the lap is wider. The fly-front zipper application is commonly used on pants and slacks, shorts, jeans, and skirts. The following procedure can be used for a fly-front zipper application:

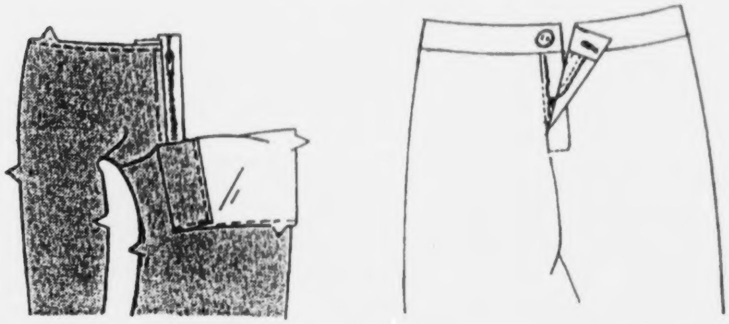
- Staystitch the waistline edge of the garment and the bottom of the fly opening. Form a square corner at the marking for the bottom of the fly opening.
- Clip to the stitching in the corner.
- Pin the center front seam with the right sides of the fabric together. Stitch to the marking for the bottom of the fly opening.
- Clip the curves and press the seam open using a pressing ham.
- Press the left extension to the inside of the garment along the center front line. Baste in place at the top edge of the garment.
- Press the right extension to the inside of the garment along the fold line. Baste in place at the top edge of the garment.
- Place the closed zipper on the right extension with the zipper coils or teeth close to the fold and pin. Make sure the lower end of the zipper is at the bottom of the opening.
- Attach the zipper foot to the sewing machine. Place to the left of the needle.
- Stitch the zipper in place close to the fold.
- Turn the garment to the right side.
- Lap the right front over the left front. Match the center front markings and pin. Baste along the center front line.
- Pin the right front of the garment to the zipper.
- Stitch the zipper to the right front along the stitching line.
- Remove pins and basting.

Figure 18.18 illustrates the fly-front zipper application.



Staystitch waistline edge and bottom of fly opening.

Press left and right extensions to the inside of the garment and baste in place.



Place closed zipper on the right extension, pin, and stitch.

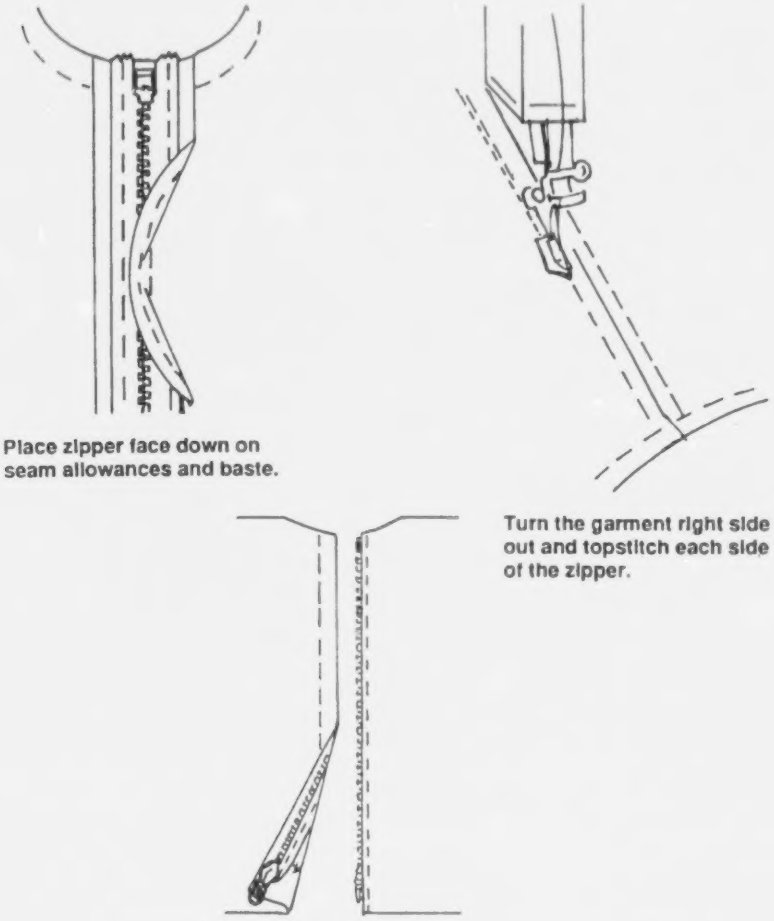
Completed Fly-Front Zipper

Figure 18.18

Separating Zippers. A separating zipper is open at both ends allowing the zipper to disconnect completely. Separating zippers are commonly used on jackets, vests, and skirts. A separating zipper may be applied in the following manner:

- Baste the opening of the garment closed. Press the seam open.
- Place the zipper face down on the seam allowances. Center the zipper coils or teeth on top of the basted seam.
- Baste the zipper to the seam allowances.
- Turn the garment right side out and baste the seam allowances and the zipper to the garment 1/4 inch on either side of the seam line. Do not baste across the bottom of the zipper.
- Topstitch each side of the zipper. Stitch slightly outside the basting.
- Pull the thread ends to the wrong side of the garment and tie.
- Remove the basting and open the center seam.

The separating zipper application is illustrated in figure 18.19.



Place zipper face down on seam allowances and baste.

Turn the garment right side out and topstitch each side of the zipper.

Completed Separating Zipper

Figure 18.19

Invisible Zippers. The invisible zipper differs from both the conventional zipper and the separating zipper. When an invisible zipper is zipped or closed, only a plain seam and pull tab show on the outside of the garment. Invisible zippers are applied to seam allowances so no stitching shows on the outside of the garment.

Manufacturers of invisible zippers include specific instructions for insertion of their brands of zippers. Manufacturers also sell special plastic zipper feet especially designed for inserting their invisible zippers. Since the methods for applying invisible zippers differ, the instructions included with the invisible zipper should be followed.

◆ Essential Questions: ◆ Basic Construction Techniques

1. What is a facing? How does a fitted facing differ from a self-facing?
2. What is the purpose of interfacing? Where is interfacing often used?
3. How does a free-hanging lining differ from an attached lining? Where is each type of lining often used?
4. What is the difference between gathered and eased seams? When is each of these seams used?
5. What is the difference between a self-casing and an applied casing? When is each of these casings used?
6. What are characteristics of a garment that is hemmed properly?

◆ Essential Questions ◆ (Continued)

7. What are four common types of collars? How do they differ?
8. What are three common types of sleeves? How do they differ?
9. How do the following types of button holes differ: bound buttonholes, machine-worked buttonholes, and hand-worked buttonholes?
10. What are the three applications used to attach conventional zippers to garments?

UNIT CONSTRUCTION

As previously discussed, the unit method of construction involves completing one unit or section of a garment at a time. As units are constructed, they are combined to form new units. Basic garment units for women include skirt front and back, slacks front and back, bodice front and back, and sleeves. Units for men include pants front and back, shirt front and back, and sleeves.

The unit method of construction has many advantages including the following:

- Less time is needed to construct a garment.
- Parts of a garment can be found easily because they are kept together in units.
- Completion of an entire unit occurs before another unit is constructed.
- Fewer trips to the sewing machine and ironing board are necessary.
- Fabric is handled less and maintains its quality.
- Work is completed in an organized manner in which speed and accuracy are emphasized.
- A sense of accomplishment is achieved as the units develop.

The unit method of construction is an efficient way to construct a garment when guidelines such as the following are observed:

- Identify the unit parts on the pattern guide sheet. Mark the units that will be completed first.
- Place all pattern pieces of one unit together so pieces will be easier to locate.
- Press all side darts toward the center unless the fabric is heavy Cut open and press flat darts on heavy fabric.
- Press all seams before joining them to seams stitched in other directions.
- Baste sleeves in place and check the position and fit.
- Baste waistbands to garments before fitting.
- Hang garments for twenty-four hours before marking hems.

Fitting During Unit Construction

A garment should be fitted during unit construction to ensure that the completed garment will fit properly. Most garments require two fittings. A third fitting may be needed when difficult fabrics or designs are used.

Before the first fitting, specific steps in the construction process should be completed. Before the second and third fittings, construction details previously checked should be stitched, finished, and pressed. In addition, any necessary alterations should be completed. During each fitting, the client should try on the garment wearing the underwear or clothing that will be worn with the garment. Altered areas should be checked for proper fit, and any areas requiring further alteration should be marked. Procedures that should be followed before and during each fitting are included in table 18.2.

◆ Essential Questions: ◆ Unit Construction

1. What are five advantages of unit construction?
2. Why should a garment be fitted on the client during unit construction?

Fitting Procedures

Fitting	Before the Fitting	During the Fitting
First Fitting	• Staystitch around the neckline and sleeve openings. • Attach interfacing. • Complete bound buttonholes. • Baste or pin any fullness (such as darts, tucks, pleats, and gathers). • Baste crosswise and lengthwise seams. Permanently stitch where fit is not questioned and other construction lines will not be crossed. • Pin circumference seams. • Pin the collar to the neckline, the sleeves to the bodice, and the skirt to the bodice. • Pin circumference edges. Include all hems.	• Examine the location and fit of darts, pleats, tucks, and gathers. • Check the location, direction, and evenness of lengthwise, crosswise, and diagonal seams. • Determine if the width of the garment is correct. • Check the location of the neck seam line and collar dimensions • Determine if the length of sections of the garment that may affect the width of other sections of the garment is correct. (ex. Lowering the waistline on the bodice might affect the fit of the skirt.) • Check the locations of all circumference seams.
Second Fitting	• Baste circumference seams. Permanently stitch seams that will not create fitting problems. • Leave circumference edges unpinned to allow for marking of hemlines.	• Check circumference seams. Include the neckline and attachment of collar, armholes and fit of sleeves, and smoothness of waistline seam and fit of skirt. • Mark hemlines on garment edges.
Third Fitting	• Stitch hemlines if no fitting problems will occur. • Stitch, finish, and press all seams approved during second fitting. • Construct lengthwise lines that cross circumference seams, such as a placket.	• Examine the appearance of the entire garment. • Study construction details carefully for accuracy. • Check the evenness of the hemlines.

Table 18.2

Chapter Highlights

- It is important to understand the meaning of pattern symbols and the instructions on the pattern guide sheet to accurately construct garments.
- The pattern guide sheet contains general information about the pattern, a variety of cutting layouts, and sewing directions for constructing the garment.
- In order for a garment to fit properly upon completion and after wearing and laundering, the fabric must be preshrunk and straightened before pattern pieces are cut out.
- The straightness of fabric can be determined by tearing the fabric, cutting along a prominent design line, or pulling a crosswise yarn.
- Before pattern pieces are placed on fabric, the fabric may be folded in a crosswise fold, a lengthwise fold, a partial fold, or a double fold.
- Napped fabrics, plaid fabrics, striped fabrics, and fabrics with geometric designs require special pattern layouts.
- Large pattern pieces marked with place-on-fold brackets should be pinned to the fabric first, followed by pattern pieces marked with grain line markings.
- Construction markings; placement lines for trims, buttons, buttonholes, and pockets; fold lines; and center front and center back lines can be transferred from the pattern to the fabric with a tracing wheel and dressmaker's carbon paper, tailor's chalk, tailor's wax, dressmaker's marking pen, dressmaker's marking pencil, or tailor's tacks.
- A fitted facing or a self-facing may be used to finish a raw garment edge, such as an armhole or neckline.
- Knitted, woven, or nonwoven interfacing is used to add firmness or help retain the shape of garment edges, collars, cuffs, waistbands, and pockets.
- The lining of a garment may be free-hanging, as in skirts and pants, or it may be attached to the garment hem, as in jackets and sleeves.
- Gathered seams, which retain fullness, and eased seams, which are smooth and unpuckered, are used when sewing together two seam edges of unequal lengths.
- A self-casing or an applied casing can be constructed to hold elastic or a drawstring in place at a waistline, neckline, sleeve, or hemline.

(Continued on page 338)

Chapter Highlights

(Continued from page 337)

- A garment requiring a hem should hang on a hanger for twenty-four hours, and then the hem should be marked, turned up, trimmed, finished, and stitched or fused in place.
- Collars (such as the flat collar, standing collar, shirt collar, and rolled collar) are often made of two layers of fabric and one layer of interfacing and then attached to a garment at the neckline.
- The kimono sleeve is cut in one piece with the garment, the raglan sleeve is attached by a diagonal seam, and the set-in sleeve is attached to the armhole.
- A waistband may be attached in one piece after the zipper is attached, it may be attached in two pieces, and it may be plain or topstitched.
- Buttonholes are constructed after a garment is completed. Buttonholes may be bound, machine-worked, or hand-worked.
- Patch pockets in a variety of shapes, all-in-one seam pockets, and separate seam pockets may be constructed and attached to garments.
- The centered zipper application, the lapped zipper application, and the fly-front zipper application can each be used to attach conventional zippers.
- In the unit method of construction, one unit or section of a garment, such as a bodice or sleeve, is completed. Then the units are combined.
- During the fitting process, the fit of the garment should be checked at the construction areas, necessary alterations should be marked and completed, and hems should be marked and stitched.

Chapter 19

Garment Alterations: Fitting and Marking

Chapter Focus

The following Essential Knowledge and Skills are discussed in this chapter:

6B Describe characteristics of proper fit in garments.

6C Determine alterations to solve common fitting problems resulting from individual differences and special needs.

Chapter Vocabulary

bodice
clip marking
grain line
pin fitting
tailor's chalk
tailor's wax
thread markings

Alterations are used to change a garment so that it fits well and is more comfortable and attractive. A good fitting garment enhances a person's image. The most perfectly constructed garment will fail to complement the wearer if it does not fit well. Ready-to-wear is sold in a wide range of sizes; however, individual figures within each size range vary. As a result, a variety of fitting problems exist. This chapter identifies problems often encountered in fitting garments. Chapter Twenty provides more detailed information on how to correct the identified problems.

GARMENT FIT

A well-constructed garment should lie smoothly over the body curves with side seams perpendicular to the floor. As discussed in Chapter Twenty, it should have sufficient ease to permit freedom of movement and to provide comfort when sitting, stooping, walking, and reaching. The characteristics of good fit in garments, for both men and women, include the following:

- neckline - There should be no gapping or wrinkling. The garment should fit close to the body.
- shoulder - The garment should lie straight from the neck to the shoulder. It should not pull to the back or the front.
- armhole - The armhole should be cut full enough for normal movement, about 1/2 to 1 inch below the armpit.
- buttonhole - The buttonhole should hold the button firmly in place without straining.

- bust and waistline darts - A bust dart should point to but not extend through the fullest part of the bust. Darts should taper to a point without pulling or wrinkling.
- waistline - The waistline should fall naturally on the waist without riding up or sliding down.
- sleeve length - Long sleeves should touch the hand where the hand joins the wrist. Sleeve length should be comfortable and appropriate for the garment with elbow darts falling at the bend of the elbow.
- hip line - Darts should shape the fullness of the garment so that it lies smoothly without wrinkles or tucks.
- side seam - Each side seam should hang straight from the armhole and waistline and be perpendicular to the floor without straining or pulling.
- garment length - The length of the garment should be in proportion to the whole garment and the individual's figure. Hems should be flat and smooth with no puckers or gathers.
- grain line - The crosswise and lengthwise grain lines should be perfectly straight and at right angles to each other.

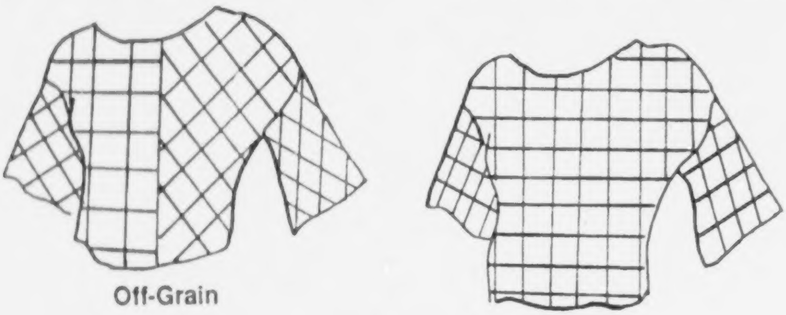
Grain Line

Grain lines must be straight in order to achieve good fit in a garment. The **grain line** refers to the directions the yarns are woven into the fabric. The lengthwise grain line consists of the stronger yarns, and the crosswise grain line consists of the weaker yarns. As a result, it is much easier to tear fabric crosswise than lengthwise. Additional information on grain may be found in Chapters Six, Twelve, and Eighteen.

If the grain line is not straight, a garment will tend to hang unevenly and pull to one side. This flaw in a garment may not be immediately visible unless the fabric is checked, striped, or plaid. With these fabric designs, it is easier to see off-grain fabric hanging crooked or uneven. When a garment is constructed of off-grain fabric, it is almost impossible to alter it to achieve a good fit. It is possible to become more skilled at detecting garments that are made with off-grain fabric. Having this ability is useful when buying and altering garments. Figure 19.1 shows two bodices constructed from checked fabric. One bodice was cut and sewn with the fabric on-grain; the other bodice was constructed with off-grain fabric.

Bias

As discussed in Chapter Eighteen, a garment that is cut diagonally across the fabric is cut on the bias. This effect creates a unique look, giving more stretch and ease to the garment. When a garment is cut at an exact 45-degree angle to the selvage, it is considered to be on the true bias. It is important to use the true bias rather than just any diagonally cut piece of fabric if an item is to be cut on the bias. To find the true bias, fold one corner of the selvage diagonally across the fabric to form a triangle as shown in the illustration on page 304 of Chapter Eighteen.



Off-Grain

On-Grain

Figure 19.1

Checking for Fit

Checking a garment for fit can be done easily if a person is familiar with the characteristics of good fit. The client should try on the garment wearing appropriate shoes and undergarments and should stand in front of a full-length mirror. It is best if the client stands erectly but not abnormally rigid. To check for fit, the garment should be checked for pulls or strains which may be causing wrinkles. These wrinkles may be caused by inaccurate grain lines or a tight or loose fit. To alleviate the wrinkles, changes in horizontal or vertical seams may be required. Figure 19.2 shows the grain lines that must be straight so that no wrinkling occurs.

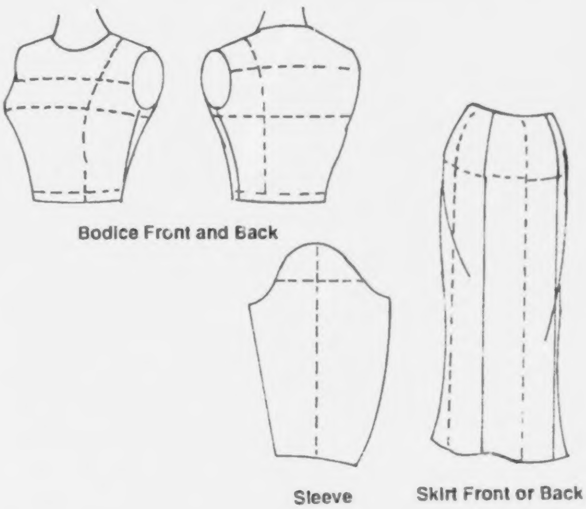


Figure 19.2

Alterations to Avoid

An alterationist is limited in what can be done to change a garment and please a client. It is always best if a client purchases a garment that is as close to the correct size as possible. Most alterations are too costly and extensive if altering more than one size smaller or larger than the original garment size. Only a limited number of changes can be made to some garments without losing the shapes of the garments. When alterations appear to be very extensive, it is probably best to recommend that the client purchase a different garment in the correct size.

Garments made of some fabrics cannot be altered successfully because they show permanently set-in creases, needle marks, or obvious discoloration. The following are examples of fabric types that are difficult to alter:

- corduroy
- fabrics with permanent press finishes
- leather
- satin or fabrics with moiré finishes
- sequin or bead trimmed fabric
- suede cloth
- velvet
- vinyl

It is important that a soiled garment be laundered or dry-cleaned before it is altered. Pressing required during the alteration process may permanently set soil or stains into fabric. This results in the garment being difficult or impossible to clean.

Measuring for Garment Fit

Knowing a client's body measurements is not always necessary when altering a garment, but it can be helpful. If a client requires frequent, extensive alterations, keeping a personal measurement chart for the client is suggested. Body measurements for ready-made garments may be taken over lightweight, closefitting clothing. The correct amount of ease should be added to these body measurements so the garment fits well. Information in Chapter Sixteen should be reviewed before taking a client's body measurements.

When altering ready-made garments, the basic measurements needed for the female figure are the bust, waist, and hips. Skirt length, back bodice length, and sleeve length may be needed for certain alterations. Different measurements are needed for altering male clients' garments than those required for female clients' garments. The basic measurements needed for the male figure are the chest, neck, waist, inseam, and sleeve length. The measurements needed depend on the garment to be altered and the alterations required.

Children's body measurements should be checked frequently due to rapid growth. The stage of physical development that a child is entering will also affect body measurements. The same basic measurements used when altering adult clients' clothing can be adapted for use in altering children's clothing.

◆ *Essential Questions:* ◆
Garment Fit

1. Why is it important that a garment fit properly?
2. Why is it important for a garment to be constructed from fabric that is on-grain?
3. How is the true bias found in a piece of fabric?
4. What types of alterations should be avoided? Why?
5. What basic measurements are needed when altering a garment for a female client?
6. What basic measurements are needed when altering a garment for a male client?

FITTING PROBLEMS FOR WOMEN'S GARMENTS

There are many different clothing styles, apparel manufacturers, and garment sizes to suit the needs of women with various figure types. Some women feel most comfortable wearing slacks and lead a lifestyle that allows them to wear slacks. Other women prefer to wear only one-piece dresses to reflect femininity. Other women want to appear as business-like and professional as possible, choosing tailored suits as the primary components of their wardrobes. Having a wide range of choices gives women the freedom to be comfortable while they can also express individualism.

The majority of women's alterations involve the lengthening or shortening of garments. However, sometimes more complex alterations are necessary. Selected examples of these more complex fit problems are discussed in the remainder of this section.

Dresses

The many styles of dresses from which to select in the ready-to-wear market can help alleviate some fitting problems. Dresses that are designed with a dropped waistline, dolman sleeves, or a blouson bodice are examples of garments that tend to require few alterations. However, alterations may still be required on some parts of the garments. A dress normally consists of a bodice and skirt, both of which can be altered in many ways. Most of the alteration procedures used on a dress bodice are similar to procedures used when altering a blouse. The same principle applies to skirts; alterations made to the skirt of a dress would be similar to those made to a skirt. Skirt and blouse alteration procedures are discussed later in this chapter.

Some of the following problems may be identified when fitting a dress:

- waistline too long or short
- waistline too tight or loose

- hip line (in a dress without a waistline) too tight
- excess gathered fullness (in a dress with a waistline seam)

Blouses

There are several areas of a blouse or bodice that can be altered to achieve an adequate fit. The shoulder, neckline, and bust areas are the most difficult areas to alter in most garments. Therefore, when purchasing a garment, it is important to select a garment that fits as well as possible in these particular areas. The basic principles that follow can be used to alter various types of bodices, such as the bodice of a dress, blouse, jacket, coat, or evening gown.

Neckline. The neckline is one of the first parts of a garment people notice because it is close to the face. There tends to be emphasis on decoration at the neckline. Therefore, it is very important that the neckline fits perfectly. Some of the following fit problems can occur at the neckline:

- back neckline fullness or tightness
- front neckline fullness or tightness
- entire neckline too large or too small
- neckline too high
- collar and neckline too small or too large

Shoulders. The shoulder area also helps frame the face and should fit the body as closely as possible. Fitting problems, such as a garment that hangs unevenly, may result from improper fit in the shoulder area. Some of the following fitting problems may occur in the shoulder area of a garment:

- shoulder of the bodice too wide
- shoulder of the bodice too narrow
- shoulder seam of the bodice too high
- sloping shoulders on the body
- protruding shoulders on the body

Bodice. The ***bodice*** is the section of a woman's garment that covers the body from the neck to the waistline. The bodice includes the darts and fullness that give the garment its overall silhouette and shape. Even loose-fitting garments usually have some shape to the bodice created by construction details such as gathers, pleats, or tucks. The following fit problems may occur when fitting a bodice:

- bodice too loose in the front or back
- bodice too tight in the front or back
- bodice too long in the front or back
- bodice too short in the front or back
- underarm bust dart too high or too low
- underarm bust dart too short
- underarm bust dart too long or too deep
- armhole bust dart too long
- armhole bust dart too short or shallow
- waistline dart too long in the front or back
- waistline dart too short in the front or back
- waistline dart too tight in the front or back
- waistline dart too loose in the front or back

Sleeves. The problems resulting from poor-fitting sleeves can be frustrating to correct. It is best to examine the garment's proportions and lines after other alterations are complete to determine the best width and length for a sleeve. Some of the following fit problems can occur in sleeves:

- too tight
- too loose
- too full at the top of the sleeve cap
- too tight at the armhole
- set-in sleeves are off-grain

Skirts

Skirt alterations are usually easy alterations to make. Skirts have few curves to fit, and they hang from the waist or hips with straight seam lines. Consequently, it is important to make sure a garment fits best in the shoulder area and neckline rather than the skirt when purchasing a garment. Some of the following fit problems can occur in skirts:

- too small in the waistline
- too large in the waistline
- too large in the upper hip or lower hip area(s)

- too small in the upper hip or lower hip area(s)
- too full in the upper back
- too tight in the upper back
- too full across the abdomen
- too tight across the abdomen

Slacks

Slacks are an important fashion concept for women. Slacks can be worn for many occasions and in some work settings. With the increased demand for slacks in the daily wardrobe, it is necessary to know the appropriate fit for slacks on the female figure. Some of the following fit problems can occur in slacks:

- waistline too loose
- waistline too tight
- too high-waisted in the back or front
- too tight in upper or lower hip line
- too large through the hips
- too large in the seat seam
- too tight through the crotch
- too baggy through the crotch
- too large in the front or back
- too wide or narrow through the leg

Figure 19.3 illustrates the important points to check when fitting women's slacks.

◆ Essential Questions: ◆ Fitting Problems for Women's Garments

1. What common fitting problems in dresses may require alterations?
2. What areas of a blouse are the most difficult to alter? How can the need for these alterations be avoided?
3. What are four areas of a blouse that can be altered to achieve an adequate fit?

FITTING PROBLEMS FOR MEN'S GARMENTS

In the past, altering men's clothing has been a more common occurrence than altering women's clothing. Men find it more difficult than women to buy ready-to-wear clothing that fits perfectly. The shape of the male body and the way clothing hangs on the male body make most alterations easier to accomplish than alterations on a woman's garment. When a man purchases a suit, there are few if any alteration charges. The price of the suit usually covers the cost of most alterations. Women's alterations, on the other

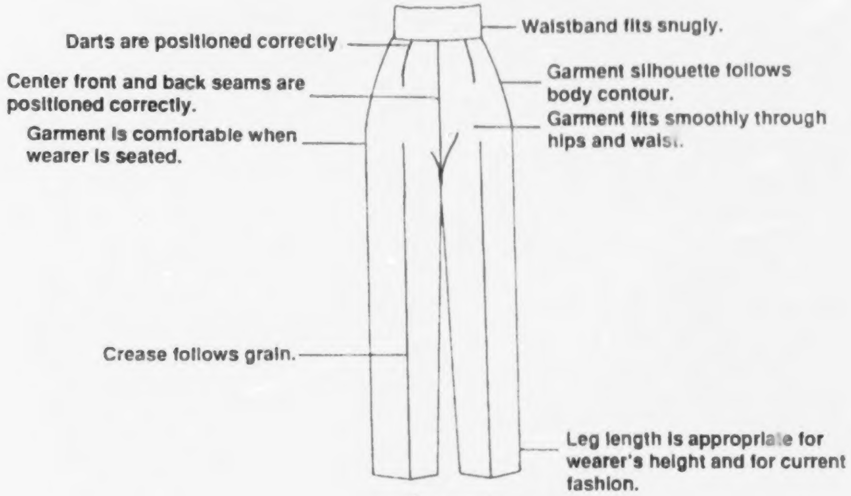

Darts are positioned correctly
Center front and back seams are positioned correctly.
Garment is comfortable when wearer is seated.
Crease follows grain.
Waistband fits snugly.
Garment silhouette follows body contour.
Garment fits smoothly through hips and waist.
Leg length is appropriate for wearer's height and for current fashion.

Figure 19.3

hand, are seldom free of charge. Some retail stores are changing their policies regarding women's alterations to make policies for female customers the same as for male customers.

Men have fewer wardrobe alternatives than women, but men still have the opportunity to develop their own senses of style. It is just as important for a man to feel self-confident and comfortable in his clothing as it is for a woman. In the past, men who viewed their clothes and appearance as important were considered by some to be pretentious and arrogant. These attitudes are changing, and society is now much more accepting of men being concerned with their appearances and overall images.

Some men may need assistance from a salesperson, alterationist, or a companion to correctly assess how certain garments look and fit their particular figures. When selecting garments for men, it is important to check color, fabric, texture, silhouette, and fit to ensure the best purchase possible.

Fit is a primary concern in selecting a man's garment because only a limited amount of change can be made to garments without losing the shape and the original design. Like women's fashions, the majority of men's alterations involve the lengthening or shortening of a garment, but additional changes can usually be made by a professional tailor or alterationist. Some examples of fit problems for men's garments are discussed in the following sections.

Jackets

Jackets, whether suit jackets or sports jackets, are an important part of many men's wardrobes. The fit of a jacket is determined by the size of a man's shoulders. The jacket length required for a particular client is determined by the man's height. Although some men may prefer a loose or close fit in their clothing, there are certain areas that must fit correctly so the jacket looks good when worn on the body. Some of the following fit problems may occur when fitting jackets on men:

- gathers under the collar
- too wide across the shoulders
- too narrow across the shoulders
- gathers under the arm
- fullness between the lapel and the shoulders
- pulling across the abdomen
- fullness around the abdomen
- pulling across the back
- sleeve wrinkles in the front or back
- collar stands away from the back of the neck

Pants

Men's pants are sized by the waist measurement and the inseam measurement. The inseam is measured from the crotch to the hem, following the inside seam of the pants. Some men may prefer more or less ease in the way their pants fit, but there are some basic areas that must fit correctly for the pants to look good on the body. Some of the following fit problems can occur in pants:

- waistline too loose
- waistline too tight
- too tight through the crotch
- too baggy through the crotch
- too wide or narrow through the leg

Shirts

Dress shirts are meant to be worn with a tie and are sized according to the circumference of the neck and the length of the sleeve. Casual shirts, such as knit shirts, flannel shirts, and some sport shirts, are sized according to the overall size of the man, such as small, medium, large, and extra-large. The ready-to-wear industry has standardized the sizing of most men's garments so they are more uniform in size than women's garments. Once men know their measurements and know what style of shirt fits them best, they are able to safely buy shirts made by different manufacturers without trying them on.

The following fitting problems may need correcting for a dress shirt to fit properly:

- sleeves too long or too short
- long sleeve shirt changed to a short sleeve shirt
- shirt too large and billowy through the body
- collar is worn or needs updating

◆ **Essential Questions:** ◆
Fitting Problems for Men's Garments

1. Why is men's clothing typically easier to alter than women's?
2. What are three examples of fitting problems for men's garments?

LENGTHENING AND SHORTENING GARMENTS

One of the most noticeable parts of a garment is the hem and where it falls on the body. The hem is a part of the garment that is turned under and stitched down. Hems are placed at the lower edges of skirts, slacks or pants, dresses, jackets, coats, and sleeves. The length of a garment is a very important aspect of the garment's overall look.

Altering the length of a garment is the most common of all alterations and is relatively easy for someone who has practiced on different types of garments. It is also the last alteration made to a garment. Additional information on hems is included in Chapters Eighteen and Twenty. Some alterations that may be needed to adjust the length of a garment are as follows:

- lengthening or shortening an uneven hemline
- lengthening or shortening a garment with trim, pleats, or ruffles
- lengthening or shortening a lined garment
- lengthening a narrow hem
- lengthening or shortening garments made of unusual materials such as leather, fake fur, vinyl, and manufactured suede
- shortening floor-length garments

◆ **Essential Questions:** ◆
Lengthening and Shortening Garments

1. What is the most common alteration for both women's and men's garments?
2. What are four examples of alterations that may be needed to adjust the length of garments?

MARKING GARMENTS FOR ALTERATION

Once fitting problems have been identified, the alterationist or fitter must mark the garment before alterations can be made. There are many different ways to mark a garment. Some methods are more commonly used when marking women's garments than men's garments, and some are more appropriate when marking certain parts of a garment.

Pin fitting is a marking method used to determine where and how much fabric should be taken in by placing straight pins in the fabric. Pin fitting is more effective in garments that are too large or too loose than in garments that are too small or too tight. Gathering the excess fabric and pinning it together as close to the body as necessary will help the alterationist identify the changes needed. Pin fitting can be an accurate, quick way to mark garments for necessary alterations. When fitting with pins, it is safest to place the pins with the points directed away from the body or toward the hemline to avoid sticking the client.

Pin fitting is a good method to use for alterations that can be done in one fitting. A disadvantage of pin fitting is that pins slip out of fabric easily if handled a great deal. If pins do slip out and the fitting line is lost, refitting the garment on the client may be necessary. This can be a time consuming, irritating problem for the client and the alterationist.

The adjustments marked by temporary pin fitting can be transferred to the garment so that the markings are semipermanent and more reliable. These professional techniques include the use of thread, chalk, wax, or clip markings. Using a lead pencil or ballpoint pen is not a professional method of marking and should be avoided.

Thread markings are long basting stitches that can be made to replace temporary pin markings. Thread markings hold the altered garment more securely and will stay in place until the alteration is completed. For this reason, using thread markings is the safest method of replacing pin markings. For many fabrics such as lace, chiffon, organdy, and white or light colored fabric, thread is the most appropriate method of marking. It is best to avoid marking with dark colored threads; these colors tend to bleed and may permanently stain the fabric. Special basting thread is available that breaks easily and is easier to remove than regular sewing thread.

Tailor's chalk is a clay-based chalk material that is used to mark fabrics. Tailor's chalk can be brushed off and tends to disappear quickly if a garment is handled a great deal. Therefore, it is best to use tailor's chalk on the wrong side of a garment. Although tailor's chalk is available in a variety of colors, it is best to use white or light colored chalk so no trace of the markings can be seen on the finished garment. ***Tailor's wax*** is a marking material made from white or colored wax in the shape of a square. It is especially popular when marking men's clothing because it can be used on the outside of a garment. Tailor's wax can be used on wool only. It melts and disappears when pressed. It may be necessary to test various types of tailor's chalk and wax on different fabrics to see which marking method is easiest to remove.

Marking a garment with small scissor cuts in the seam allowance is referred to as ***clip marking***. The primary benefit to clip marking is to aid in realigning the grain line when a large amount of the garment has been ripped apart. Scissor clips should be small, only 1/4 inch deep into the seam allowance, and should be made with care. If clips are made much deeper, they may perforate the seam and damage the garment. Once clips are placed in the seam allowance, the possibility of using the seam allowance for any further adjustments may be eliminated.

An easy method for marking skirt and dress hemlines is to use a skirt marker or hem marker. The hem marker is a ruler attached to a weighted base. The hem marker marks a skirt or dress hem while the garment is on a dress form or human body. Some hem markers have an adjustable device that releases powdered chalk to mark hems by use of an attached pressure bulb and hose. Other hem markers have an adjustable clamp for inserting pins or marking hems with chalk. Pin fittings would not be necessary in most cases where a hem marker is used.

Another marking tool that can replace pin fittings is the automatic hem gauge or sleeve gauge. This tool is a 3-by-5 1/2 inch gauge used to turn garment hems, sleeve hems, and edges of pockets. This gauge is placed on the fabric, the fabric is turned up the desired amount, and the item is pressed without the use of pins.

◆ Essential Questions: ◆
Marking Garments for Alteration

1. When is pin fitting a more effective method of marking garments for alteration?
2. What three methods are used to transfer temporary pin markings to the garment so that markings are more reliable?
3. What is an easy method for marking skirt and dress hemlines?

Chapter Highlights

- The most perfectly constructed garment will fail to complement the wearer if it does not fit well.
- A well-constructed garment should lie smoothly over the body curves, have side seams that are perpendicular to the floor, and have sufficient ease to permit freedom of movement and comfort.
- When a garment fits properly, the grain line is perfectly straight in both the lengthwise and crosswise directions.
- Cutting a garment diagonally across the fabric is called cutting on the bias. Bias-cut garments have a unique look and more stretch and ease than garments cut on the lengthwise grain.
- When checking for fit, the client should wear the garment with appropriate shoes and undergarments and should stand erectly in front of a full-length mirror.
- Alterations to avoid include those involving garments to be altered more than one size smaller or larger, garments made of fabrics that are difficult to alter, and garments that are soiled.
- When altering ready-made garments, the bust, waist, and hip measurements are needed for female clients. The chest, neck, waist, inseam, and sleeve length measurements are needed for male clients.
- Men's clothing is usually easier to alter than women's clothing because of the shape of the male body and the way clothing hangs on the male body.
- The hem is a part of the garment that is turned under and stitched down. Altering the length of a garment is the most common of all alterations and is relatively easy to accomplish.
- Pin fitting is a temporary marking method used to determine how much fabric should be taken in by placing straight pins in the fabric.
- Pin fittings can be transferred to garments in a variety of ways including the use of thread, tailor's chalk, tailor's wax, and clip marking.

Chapter 20

Garment Alterations: Adjustments

Chapter Focus

The following Essential Knowledge and Skills are discussed in this chapter:

6A Demonstrate correct procedures utilized in garment fitting and alteration.
6C Determine alterations to solve common fitting problems resulting from individual differences and special needs.
6F Utilize appropriate techniques and processes to alter, repair, and customize textile and apparel products according to quality standards.

Chapter Vocabulary

- alteration tag
- fitter
- gusset
- pin out
- shoulder pads
- shrink out
- taken in

As discussed in Chapter Nineteen, there are many types of fitting problems. This chapter addresses the most common fitting problems and identifies specific procedures for marking and sewing. In addition, general information is provided regarding alteration procedures. Although an alterationist may encounter other problems, with practice and forethought, the procedures in this chapter may be adapted and applied to most alteration tasks.

The skills of good alterationists are in demand in today's service-oriented society. Alterationists may be employed in retail stores, commercial dry cleaners, commercial laundries, or businesses that perform custom sewing and altering. The demands for skilled alterationists are increasing due to the increased number of men and women in the work force. As discussed in Chapter Nineteen, many stores are now extending their free alteration services to women and men. Increased sales of apparel are likely to result in more people needing alteration services.

Organization is the key to being an effective alterationist. It is important to plan ahead so that work is enjoyable and effective. Several time management principles can be incorporated into an individual's work plan to increase efficiency and quality of work. Implementing time management principles may improve job satisfaction and employee loyalty. The principles of motion economy, discussed in Chapter Thirteen, can be helpful to employees who work in the area of alterations.

Time and energy savers that may be helpful to an alteration employee include the following:

- Organize all supplies in a sensible, neatly arranged manner.
- Keep all machines and tools in good working order with extra parts available in case of an emergency.
- Keep the work area clean, comfortable, and well-stocked.
- Make sure the work area is well-lighted.
- Complete all of one particular task such as clipping, pressing, ripping, or marking before moving to another task.

Like many skills, practicing the techniques involved in altering clothes helps a person become more skilled and capable of working faster. As experience is gained, the process becomes easier.

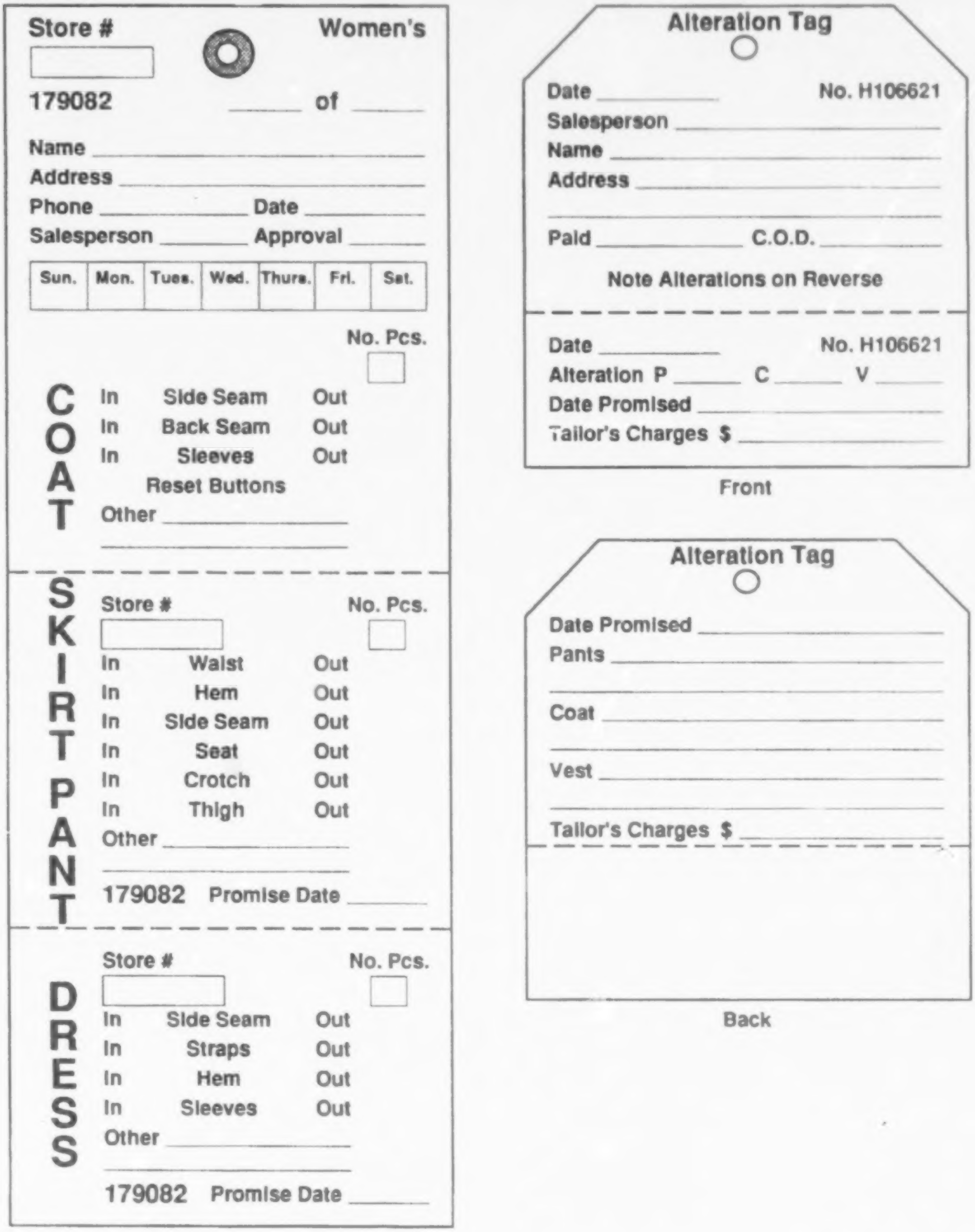
ALTERATION TAGS AND MARKINGS

Specialty stores and department stores that have alteration departments may have salespeople trained to fit and mark garments for customers. A person who is trained to view garments on a client, make fitting suggestions, determine what changes are possible, and actually mark the garment is called a ***fitter***. The fitter may also be one of the people responsible for completing the alteration tag. This tag travels with the garment from the sales floor to the alterations department.

For more difficult alterations and for many women's alterations, the alterationist is asked to fit the garment in the department. This procedure is time consuming but often alleviates the chance of error and poor communication between the fitter and the alterationist. Letting the customer discuss fit problems directly with the alterationist may give the customer more confidence that the garment will be altered to his or her satisfaction.

The ***alteration tag*** is a tag used to record alteration instructions. It is attached to the garment to be altered and is the primary source of communication between the fitter and the alterationist. The alteration tag contains all of the information necessary to alter the garment and return it to the client. If the alteration tag is completed incorrectly, the alteration will probably be completed incorrectly. For this reason, it is very important to check the alteration tag against the markings on the garment to make sure they correspond. If the alterationist has any doubt or questions about the information on the tag, additional communication with the fitter or the client may be necessary.

The alteration tag may be completed by the fitter, salesperson, or alterationist. It includes vital information about the client such as name, phone number, and address. It should also have a description of the alteration(s) needed, the salesperson's name or identification number, the date of the fitting, and the date the garment will be ready. Other helpful information that might be included are any necessary body measurements, the number of garment pieces being altered for the client, and the store number if the garment is sent to another location where alterations are made. Most alteration tags have a perforated edge with a corresponding code number on both pieces of the tag. One portion is torn off and given to the client; the other portion is attached securely to the garment. The client uses the tag to claim his or her garment. Two examples of alteration tags are illustrated in figure 20.1.



Store # ☐ **Women's**

179082 ______ **of** ______

Name ____________________

Address ____________________

Phone ____________ **Date** ____________

Salesperson ________ **Approval** ________

Sun.	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.

No. Pcs. ☐

COAT

In Side Seam Out

In Back Seam Out

In Sleeves Out

Reset Buttons

Other ____________

SKIRT PANT

Store # ☐ **No. Pcs.** ☐

In Waist Out

In Hem Out

In Side Seam Out

In Seat Out

In Crotch Out

In Thigh Out

Other ____________

179082 **Promise Date** ______

DRESS

Store # ☐ **No. Pcs.** ☐

In Side Seam Out

In Straps Out

In Hem Out

In Sleeves Out

Other ____________

179082 **Promise Date** ______

Alteration Tag

Date ________ **No. H106621**

Salesperson ____________

Name ____________

Address ____________

Paid ________ **C.O.D.** ________

Note Alterations on Reverse

Date ________ **No. H106621**

Alteration P ______ **C** ______ **V** ______

Date Promised ____________

Tailor's Charges $ ____________

Front

Alteration Tag

Date Promised ____________

Pants ____________

Coat ____________

Vest ____________

Tailor's Charges $ ____________

Back

Figure 20.1

Some standard symbols are used in marking garments for alterations. These symbols may be used on alteration tags, so it is important to understand what they represent. The symbols described in figure 20.2 are marked on garments with tailor's chalk or tailor's wax. Some of these symbols may be adapted by individual fitters and alterationists. The fitter and alterationist who work for a particular business must communicate clearly and be aware of any personal adaptations of the standard symbols so that alterations are done as requested by each customer or client.

◆ *Essential Questions:* ◆
Alteration Tags and Markings

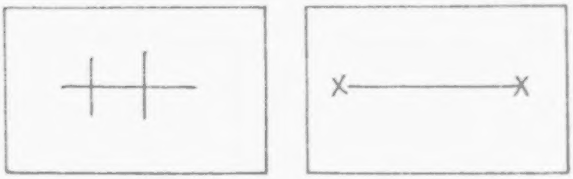
1. Why is the alteration tag an important communication tool?
2. What information is included on the alteration tag?
3. What are five standard alteration symbols that may be used on alteration tags?

GENERAL ALTERATION PROCEDURES

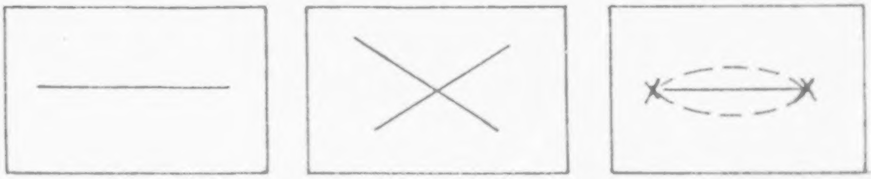
The large number of alterations that can be performed on any one type of garment prevent detailed explanations of each possible alteration. Some of the most common and adaptable alteration solutions are described in this chapter. One section of this chapter is devoted to lengthening and shortening garments. Therefore, lengthening and shortening is not included with alteration procedures for each garment type.

It requires more time to alter a garment that is lined than one that is unlined. Most of the procedures used to alter the garment are also used to alter the lining. If the lining is not altered properly, the garment will fit poorly and the lining may hang below the edges of the garment.

Altering a garment with a facing usually requires a minimum amount of change, such as trimming or clipping. Some garment alterations require that a new facing be cut to replace a facing that no longer fits the garment. When making alterations to a garment, the lining or facing must be separated from the garment so the necessary alterations can



Lengthen **Release Space**



Shorten **Alter Only One Side** **Take In Space Between**

Figure 20.2

be performed. Once these alterations have been completed, all altered facings and linings should be reattached to the garment.

Some of the following guidelines will help make altering ready-to-wear garments an enjoyable, productive task:

- Do not sacrifice quality for speed. Most clients usually prefer to wait for an accurate, professional alteration than to rush the alterationist into doing a less than perfect job.
- Avoid underestimating the time required for completing an alteration when promising a garment to a client. It is usually better to overestimate than to underestimate the expected time needed to do the work. It is important that the garment is ready when the client arrives to pick it up.
- Double-check the instructions on the alteration tag. Make sure the instructions correspond to the markings on the garment.
- Call the client if questions arise about the alterations to be performed after the client has left the store.
- Consider construction design, fabric finish, type of fabric, seam widths, and the age of the garment before making a decision that requires a garment alteration.
- Keep the seam allowance as wide as possible for future alterations that may require letting out a seam.
- If you examine the way in which a garment is constructed before ripping it apart, it will be much easier to put the garment back together when alterations are completed.
- Be extremely careful when ripping or cutting a garment. A small slip or accidental clip can ruin a garment and cause great expense to the store or business responsible for the garment.
- Make a daily plan so that as much work as possible can be completed. Some alterationists prefer to do the most difficult alterations early in their work day, saving the easier, more enjoyable tasks for later in the day.

◆ Essential Questions: ◆ General Alteration Procedures

1. Why does it take more time to alter a lined garment than to alter an unlined garment?
2. What are five guidelines that help make altering garments an enjoyable, productive task?

DRESS ALTERATIONS

The waistline seam of a dress is a structural feature that does not appear in other garments such as skirts or jackets. Because the waistline seam is somewhat unique to a dress and is not duplicated in a bodice or a skirt, the alteration procedures included in this section focus primarily on adjustments made to waistlines. Other procedures used to alter dresses are the same as those used to alter skirts or blouses. Dress alterations that are discussed in this chapter include the following: lowering the waistline, raising the waistline, increasing the waistline, decreasing the waistline, and increasing the hip line.

Lowering the Waistline

A waistline that should be lowered will fall above the natural waistline, and the wearer of the garment may feel that it constantly needs to be pulled down. A very uncomfortable and unflattering fit results. The amount of alteration or lowering that can be done to the waistline of a dress relates directly to the amount of seam allowance already in the garment. Most ready-to-wear garments are constructed with a standard 5/8 inch waistline seam. If this is the case, the garment waistline could only be lowered by 3/8 inch, leaving a 1/4 inch seam. Another option to correct this fitting problem would be the insertion of a separate placket or band at the waistline. This procedure usually changes the design of the dress significantly.

To correct a waistline that falls too high on the body, the following procedure may be used:

- Determine the location of the client's natural waistline and mark the corresponding location on the skirt with a row of pins or tailor's chalk.
- Separate the bodice from the skirt by ripping the waistline seam.
- If there is a zipper, remove the lower portion extending 2 inches above the waistline; normally there is no need to remove the entire zipper.
- Pin the bodice and skirt back together using the new chalk or pin line for guidance.
- Sew the bodice and skirt together on the new bodice seam line. Do not change the skirt seam line as this will not lengthen the bodice. The new waist seam line will have a different amount of seam allowance on the bodice side than on the skirt side. Press the seam toward the bodice, trimming away any excess seam allowance as needed.

Raising the Waistline

When the bodice is too long, there is usually an excess amount of fabric that bunches up below the waist. The same procedure for lowering the waistline is followed for raising the waistline except the new waistline seam is pinned on the bodice rather than the skirt. The new waistline seam allowance is longer on the bodice side than the skirt side and may need to be trimmed.

Increasing the Waistline

Once the amount of fabric to be let out is determined, the skirt and bodice of a dress can be altered to increase the waistline and make a garment more comfortable for a fuller figure. The side seams may pull and any closures may be strained when the waistline is too tight. To correct a waistline that is too tight, the following procedure may be used:

- Rip the side seams open from the waistline seam. This opening should be 2 to 4 inches toward the underarm and 2 to 4 inches toward the hemline.
- Mark the new stitching line on the seam allowances with tailor's chalk or pins.
- Restitch each side seam along the new marking, tapering off to the original seam under the arm and down toward the hip line.
- Press the new seams open.
- If additional width is needed, release the waistline darts in equal amounts in both the skirt and the bodice. Resew the waistline seam.

Decreasing the Waistline

If the waistline is too loose, the excess fabric should be taken in and possibly removed. Unless this fit problem is excessive, it is often overlooked. Many clients may prefer some extra ease in the waistline area. This extra ease can easily be disguised by a belt. This fit problem appears on the garment as too much fabric around the waist. The same procedure for increasing the waistline is followed for decreasing the waistline except that the seams are taken in rather than let out.

Increasing the Hip Line

If the hip line of a dress without a waistline needs to be increased, the bodice of the dress may be too long and have excess folds of fabric around the waistline. The bodice area is actually being prevented from falling into place because the dress is not sliding over the hips. An inexperienced fitter may look at a dress with this fit problem and decide that the fullness should be removed by altering the bodice. However, the right procedure to correct the problem is to add more width to the hip line area. To correct a bodice that is too long on a dress without a waistline seam, the following procedure may be used:

- Rip the side seams apart from 2 inches below the waist to approximately 6 to 8 inches below the hip line.
- Mark the new stitching line on the seam allowances with tailor's chalk or pins.
- Restitch the side seams along the new markings, tapering off to the original seam.
- Press the new seam open.
- Release the center front seam and center back seam if the garment has these seams and additional width is needed.

◆ Essential Questions: ◆ Dress Alterations

1. What four alterations are commonly made to waistlines?
2. What signs indicate that a waistline needs to be lowered?
3. What signs indicate that the hip line needs to be increased?

BLOUSE AND SHIRT ALTERATIONS

The basic components of a blouse or shirt are the neckline, shoulders, bodice, and sleeves. Each of these areas is discussed individually, and procedures may be adapted when altering other garments. As stated in Chapter Nineteen, some of the following procedures may be used when altering jackets, coats, dresses, blouses, or evening gowns. For example, few alterations are done to men's shirts, but those shirt alterations that are required correspond to alterations used to adjust a woman's bodice or blouse. Several alterations described in this section may also be used to alter jackets.

Neckline Alterations

As discussed in Chapter Nineteen, it is important that the neckline of a garment fit perfectly. Various problems may cause the neckline to fit poorly. For example, a neckline may gap if it is too large or cause discomfort if it is too small. The following neckline alterations are discussed in this chapter: decreasing back neckline fullness, increasing back neckline fullness, decreasing front neckline fullness, and lowering the neckline.

Decreasing Back Neckline Fullness. A neckline that has too much fullness in the back has vertical folds in the back bodice, and the back stands away from the body rather than fitting the body closely. To correct a neckline with fullness in the back, the following procedure may be used:

- Determine the amount of fullness to be removed by pinning the excess fabric down one side of the zipper. If the garment does not have a zipper, pin the excess fabric along the center back seam. Taper this pin line to the bottom of the zipper or center back seam.
- Record the amount of fullness to be removed on the alteration tag.
- Transfer the pin line marking with tailor's chalk and remove the pins.
- Rip the zipper away from the bodice, beginning at the neckline and continuing to 1/2 inch below the chalk marking.
- Press the original seam line to eliminate the crease. Fold the fabric along the chalk marked line to create the new seam line. Press the new seam line in place.
- Restitch the zipper, sewing the underside of the zipper first and then stitching the overlapping seam.

Increasing Back Neckline Fullness. If the back neckline is too tight, releasing the zipper seam may be difficult because of the limited amount of seam allowance. Releasing the front of the bodice may reduce some of the stress in the back neckline; if the problem is severe, it is unlikely that it can be successfully altered.

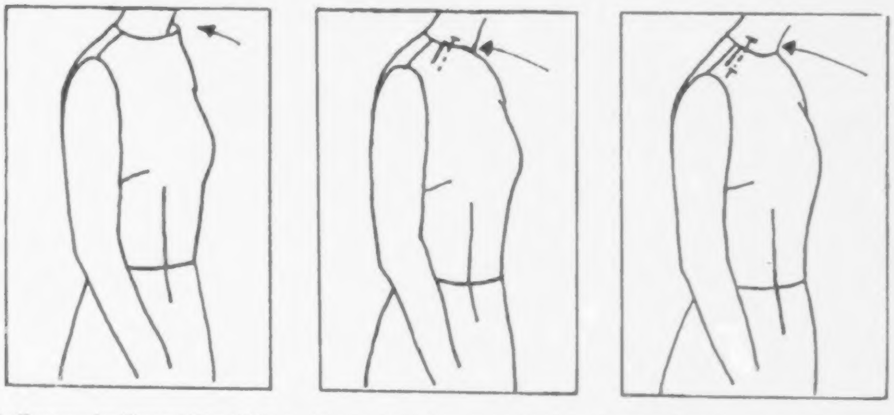
Decreasing Front Neckline Fullness. A neckline that has too much fullness in the front stands away from the neck and chest rather than fitting the body closely. This fitting problem and optional alterations are illustrated in figure 20.3.

To correct a neckline with excess fullness in the front, the following procedure may be used:

- Pin the excess fullness out of the neck by making small tucks or darts of equal amounts on both sides of the bodice.
- Remove the excess fabric from the shoulder seams in equal amounts if more than 1 inch of fullness is being removed.
- Use a piece of seam tape cut 1 inch longer than the neckline measurement to adjust the fullness.
- Match the center front of the garment to the middle of the seam tape and pin the garment and seam tape together on the stitching line.
- Stitch the seam tape to the neckline seam, easing the neckline fullness into the seam.
- Clip the seam tape and the seam line to allow the neckline to lie flat.
- Press the neckline using a damp press cloth to shrink out the excess fullness. To ***shrink out*** is to make an area on a garment smaller with the use of heat, moisture, and steam.

Lowering the Neckline. Lowering the neckline is a necessary alteration if the neckline is too tight or too high. In either case, it is necessary to locate a new neckline on the garment that is comfortable for the client. To correct a neckline that is too tight or too high, the following procedure may be used:

- Mark the new neckline with pins. Replace the pins with thread markings.
- Remove the facing from the garment.
- Staystitch the entire neckline to prevent unnecessary stretching.
- Trim the neckline to 5/8 inch from the line of staystitching.
- Lay the new neckline flat on a piece of paper. Trace around the neckline curve. Remove the garment. Measure an equal distance from the traced curve all around the neckline curve to create a new facing pattern. Cut the new facing from the same or similar fabric, making sure the fabric is cut on-grain.



Fullness in Front Neckline

Front Neckline Fullness Reduced with Darts

Front Neckline Fullness Removed in Front Shoulder Seam

Figue 20.3

- Staystitch the neckline edge of the new facing.
- Sew the new facing to the new neckline using a 5/8 inch seam allowance.
- Clip the seam and press it open so that it lies flat.
- Trim the new seam line as needed and press as needed.

If the new neckline falls below the top of the zipper opening, the zipper must be removed. The zipper should be sewn in after the new neckline and facing have been attached using the same zipper application procedure that was used originally.

Shoulder Alterations

The shoulder area is another area of a garment that should fit perfectly. Many men's garments are sized primarily by the shoulder width. It is best to choose a garment that fits as closely as possible in the shoulder area. Other areas of the garment can then be altered as necessary. Shoulder alterations that will be discussed in this chapter are as follows: decreasing shoulder width, increasing shoulder width, decreasing fullness at shoulder and neckline, and decreasing fullness around armholes.

Decreasing Shoulder Width. If the shoulders of a garment are too wide, they hang off the body and form vertical folds between the armhole and the bust. Usually, this alteration of the sleeve and shoulder affects the side seam of the bodice. When the shoulder seam is shortened, the armhole becomes larger due to excess fabric from the shoulder being removed. The bodice side seam must be ***taken in*** for the sleeve to fit into the larger hole. A seam is taken in by sewing larger seam allowances than were originally sewn in the garment.

To correct the problem of shoulders that are too wide, the following procedure may be used:

- Pin out the excess fullness by pinning a vertical tuck at the shoulder seam down through the bust area. To ***pin out*** is to remove the excess fabric by inserting straight pins through tucks of fabric. This procedure should raise the shoulder seams to the correct positions on the body.
- Measure the amount of fabric pinned in the tuck and mark that amount at the top of the shoulder seam. Continue a line of marking toward the original armseye seam, tapering until the original armseye seam is reached.
- Rip the sleeves away from the bodice, being sure to mark each sleeve and shoulder with matching symbols so that each sleeve is reset in the correct armhole. Also mark the top of the sleeve at the shoulder seam line so the grain line will not be changed during the alteration.
- Trim the new sleeve line to 5/8 inch, tapering down to the bottom of the armhole. Do not trim any fabric on the sleeve itself.
- Take in the bodice side seams as much as necessary so the sleeve fits into the new armhole.
- Pin the sleeve back into the armhole. Some easing may be required when resetting each sleeve into the armhole. If there is no staystitching on the sleeves, it may be helpful to apply staystitching to the tops of the sleeves.
- Stitch the top of the sleeve and the armhole together. A double row of stitching, one row 5/8 inch and one row 3/8 inch from the edge, will help strengthen the armseye seam.
- Trim and grade the seam as needed. Press the seam toward the sleeve.

Increasing Shoulder Width. Altering a garment that is too tight across the shoulders can be time consuming and difficult. To successfully complete this alteration, there must be enough fabric in the seam lines to correct the problem. More expensive garments, such as high quality men's suits, are manufactured with extra wide seams to help achieve a perfect fit through alterations. The success of the alteration will also depend on how tight the garment is and if it is constructed with certain design lines. The areas that can be let out, if they exist, are the center back seam, shoulder darts, shoulder seams, and princess line seams.

Decreasing Fullness at Shoulder and Neckline. When the garment does not sit on the shoulders but rides up along the neckline and underarm areas, the shoulder line is too high. Even if the bodice fits in all other areas, the bust darts fall at the right place, and there is ample ease through the back, high shoulder seams can cause the neck and underarm to fit poorly. To correct the problem of a high shoulder line, the following procedure may be used:

- Pin out the fullness in the shoulder seam. If the fullness is located in either the front or back, the excess fabric should be pinned out on the corresponding part of the body. If the amount of change needed is equal to the front and back, the measurements should be equal on both sides of the shoulder seam.
- Measure the amount of fabric that has been pinned. Make a note of the amount of excess fabric on the alteration tag.
- Mark the new shoulder seam line with tailor's chalk.
- Separate any facings, collars, or sleeves from the shoulder seam. It may not be necessary to remove them completely. Reduce the size of each of these garment pieces to fit into the new shoulder area. If the alteration is slight, it may be possible to ease these pieces back into the shoulder area.
- Stitch the new shoulder seam line before removing the old shoulder seam line.
- Trim the new seam line to 5/8 inch and remove the old stitches from the original seam line.
- Press the new shoulder seam open.

Decreasing Fullness Around Armholes. A common figure problem is sloping shoulders. A slight slope can be ignored or camouflaged by adding thin shoulder pads. ***Shoulder pads*** are pieces of foam or padding that are shaped to fit over the shoulder and provide a tailored contour to a garment. A pronounced slope may need padding and altering. This figure problem causes a garment to gather and produce folds at the front armholes. If the problem of sloping shoulders affects a coat or suit jacket, it should be resolved with thicker shoulder pads rather than any seam line alteration, as shown in figure 20.4.

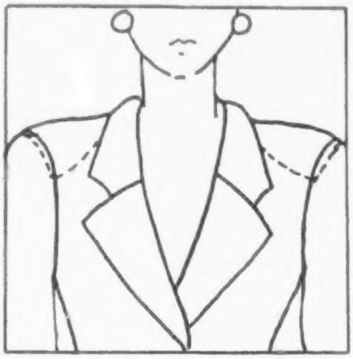


Figure 20.4

The following procedure may be used to decrease fullness around armholes:

- Pin out the fullness in the bodice under the arms to the shoulder seam. The largest amount of excess fabric will be at the armhole edge tapering into the original seam at the neck. No more than 3/4 inch should be pinned out of the armhole.
- Measure the amount of fabric that has been pinned. Write the amount of excess fabric on the alteration tag.
- Mark the new shoulder seam line with tailor's chalk. The new seam line should taper from the armhole toward the original

seam at the neckline.

- Trim the seam as needed and press open.
- Reset the sleeve into the new armhole. It should not be necessary to remove the sleeve from the bodice and adjust the bodice side seams because of the small amount of fabric altered in this procedure. There should be enough ease in the sleeve cap that it can be easily sewn back to the bodice.

Bodice Alterations

There are several areas of the bodice other than the neck and shoulder areas that can be altered. One of the primary techniques used for changing bodices is through the use of darts. Darts may be added, removed, relocated, or increased or decreased in size. Darts can be added to take up fullness; darts may be let out to provide more ease. There are several different types of darts used on women's garments. There are no darts on men's garments. The following bodice alterations are discussed in this chapter: increasing bodice fullness, decreasing bodice fullness, shortening bust darts, shortening waistline darts, and removing waistline darts.

Increasing Bodice Fullness. When the bodice area of a garment is too tight, it can be very uncomfortable. A garment with this fitting problem pulls across the back and chest; fasteners (such as buttons, hooks, zippers, and snaps) are strained and gaps are created. To correct the problem of a too tight bodice, the following procedure may be used:

- Pin along the side seams of the bodice indicating the amount of fabric to be released from the side seams.
- Measure the distance from the pin line to the seam line and make a note of this measurement on the alteration tag. This is the amount to be released from the side seam. The amount that can be released depends on the width of the seam allowance.
- Mark a new seam line with tailor's chalk on the seam allowance if there is no seam guide on the sewing machine used.
- Rip the bodice side seams completely apart. Remove any hem on the lower edge of the bodice at the side seams and any facings attached to the armholes. In most cases, the entire side seam must be released to solve this fit problem.
- Release a portion of the armseye seam if there is a sleeve. Begin releasing the armseye seam at the center of the underarm. Release the armseye seam about 2 to 3 inches both directions (toward back and front of armseye). Before ripping, check to see if the sleeve has enough ease so that it will fit in a larger armhole without being ripped apart too much. The less sleeve reconstruction necessary, the easier and less time consuming this alteration becomes.
- Press out the original crease of the side seam.
- Restitch the new side seam.
- Press the new side seam open.
- Ease the sleeve back into the new armhole and sew into place if the sleeve has been ripped apart.

Decreasing Bodice Fullness. The same procedure for increasing fullness around the bodice is followed for decreasing fullness around the bodice, except that the side seams are taken up rather than let out. The armseye seam should be ripped out by beginning to release the seam at the underarm. The armseye seam is ripped 2 inches toward the front and 2 inches toward the back of the seam so that fullness can be removed.

Shortening Bust Darts. The bust darts in the bodice should point to the bust but not extend beyond the bust point. The possibility of altering darts depends on whether the manufacturer has clipped or marked the darts in a way that prohibits them from being altered. To shorten a bust dart, the following procedure may be used:

- Determine where the dart should end and mark that spot with a pin.
- Measure the new length of the dart and

make a note of that measurement on the alteration tag.

- Release each side seam only where the dart intersects the side seam. Do not release stitching on the dart.
- Mark a new stitching line for the dart, if necessary, beginning on the original dart stitching line and tapering to the point where the new dart should end.
- Begin stitching the dart on the original dart line at the side seam.
- Taper the stitching to the new point of the dart.
- Remove the stitching line of the old dart and press.
- Restitch the side seams and press open.

Shortening Waistline Darts. The same procedure is used for this alteration as the one described for shortening bust darts, except that the waistline seam is released where the darts intersect it. It is only necessary to release the section of the waistline seam that allows access to the waistline darts.

Removing Waistline Darts. Sometimes it is best to remove waistline darts completely, allowing easier movement. This alteration may be used to alter a garment for a full figure. The garment should be fitted to determine if waistline darts in the front of the bodice, in the back of the bodice, or in both the front and back should be released. To correct the problem of tight waistline darts, the following procedure may be used:

- Record on the alteration tag approximately how much and where the ease is needed (front, back, or both front and back). No markings on the garment are usually necessary when fitting the client.
- Use the following procedure if fullness is needed in the back of the garment:
  - Release the waistline seam across the back, stopping 1 inch short of each side seam for a garment with a waistline seam and no zipper.
  - Release the back waistline seam without releasing 1 to 2 inches of seam line that intersects with the zipper for a garment with a waistline seam and a zipper.
  - Release the dart stitching and press the creases out of the bodice.
  - Follow procedures described in Chapter Eighteen for easing and gathering seams to ease or gather the bodice seam allowance to the skirt seam allowance.
  - Restitch the waistline seam in the back of the bodice.
- Use the following procedure if fullness is needed in the front of the garment:
  - Release the waistline seam in the front of the bodice 3 inches on each side of each dart.
  - Release the dart stitching and press the creases out of the bodice.
  - Follow procedures described in Chapter Eighteen for easing and gathering seams to ease or gather the bodice seam allowance to the skirt seam allowance.
  - Restitch the waistline seam in the front of the bodice.
- Release the bodice side seams and stitch narrower side seams if additional bodice fullness is needed. When restitching the waistline seam, match each bodice side seam to the corresponding skirt side seam.
- Press the new waistline seam toward the skirt.

Sleeve Alterations

One of the last areas of the bodice to be altered is the sleeves. It is important to look at the sleeves once all other portions of the garment are altered. The sleeves should be in proportion to the rest of the garment and hang in the manner the designer intended. Sleeve alteration procedures discussed in this chapter are as follows: increasing fullness in sleeves, increasing ease in sleeves by inserting gussets, decreasing width in sleeves, and shortening cuffed sleeves.

Increasing Fullness in Sleeves. One method for altering sleeves that are too tight around the circumference of any part of the arm is to let out seam allowances. To correct the problem of tight sleeves, the following procedure may be used to let out each sleeve seam allowance:

- Place pins on the underarm seam of the sleeve indicating where the seam should be let out. Write on the alteration tag how much the sleeve must be let out.
- Determine if there is enough seam allowance to use this method or if a gusset is required.
- Release the armseye seam beginning at the intersection of the armseye seam and the side seam if the seam allowance is to be released. Release 2 inches in each direction.
- Release the original sleeve seam line in the area of the sleeve where additional fullness is needed.
- Stitch a new sleeve seam line beginning at the old seam line and tapering to the end of the seam that intersects with the armseye seam. Press the old crease marks out of the sleeve and press the new sleeve seam open.
- Restitch the armseye seam, easing the extra fullness of the sleeve into the armhole.

Increasing Ease in Sleeves by Inserting Gussets. Another method of adding fullness to sleeves is by inserting gussets. A ***gusset*** is a diamond-shaped piece of identical or similar fabric inserted to provide more ease of movement and increased strength. It is important to have enough of the original fabric to make gussets. To apply a gusset to a sleeve, the following procedure may be used:

- Mark the place on the sleeve where the addition of ease can stop.
- Release the sleeve seam from under the arm to the marked point on the sleeve. Backstitch the sleeve seam at this marked point. Release the armseye seam about half way to the shoulder seam in the front and back.
- Cut the diamond-shaped gusset from the same fabric as the garment. Cut the piece longer than the alterations indicate and wide enough to accommodate four seam allowances. Mark the point on the smallest end of the gusset that will match the point at the end of the sleeve seam.
- Match and pin the gusset to the sleeve seam allowances with right sides together.
- Stitch the gusset to the sleeve, taking extra care to match the point of the gusset with the ending point of the sleeve seam line. Both gusset seams will be matched to this point exactly. This will help the sleeve lie smooth and not bulge at the intersection.
- Ease the enlarged sleeve back into the armhole. The amount of easing necessary to reset the sleeve will depend on the width of the gusset and how much bigger the sleeve has been made. It may be necessary to let out the side seam of the bodice slightly to accommodate the larger sleeve. This option can be used only if the fit of the garment is not affected by releasing the side seams.
- Press the new gusset seam lines and the armseye seam.

Decreasing Width in Sleeves. When a sleeve is too loose it may detract from the overall appearance of a garment. A sleeve that is too loose may not be noticed by the client, so the fitter should be able to detect this fit problem. The alteration procedures used for a short sleeve and a long sleeve are basically the same.

To correct the problem of loose fitting sleeves, the following procedure may be used:

- Pin out the excess fabric along the sleeve seam. Measure the amount of fabric taken up and note the amount on the alteration tag.
- Once the garment has been removed from the body, mark the new sleeve seam line on the inside of the sleeve with tailor's chalk.
- Release the armseye seam and the hem of the sleeve partially if fullness is being taken out of the entire sleeve. If only the lower portion of the sleeve is adjusted, it is not necessary to release the armseye seam. If only the upper portion of the sleeve is adjusted, it is not necessary to release the hem of the sleeve. If only a small amount of fullness is taken up, it may be possible to taper the stitching to the old seam lines at

one or both ends of the sleeve. Using this procedure eliminates the need to release the armseye seam and/or the hem of the sleeve.

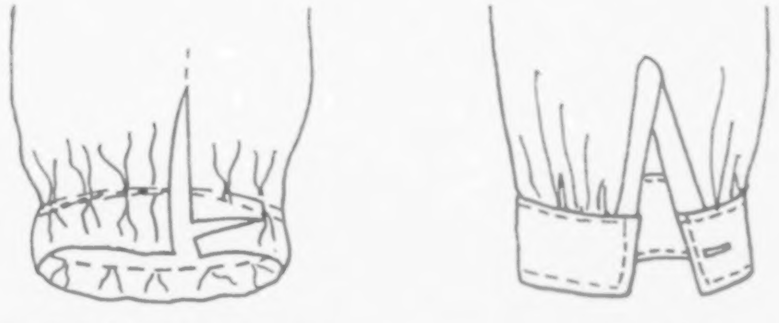
- Stitch the new sleeve seam line beginning at the armhole and stitching toward the hem of the sleeve.
- Rip out the old seam line and press the new seam open.
- Reset the sleeve into the armhole. If too much of the sleeve has been taken up, the side seam may need to be adjusted a small amount to accommodate the smaller sleeve. This option can be used only if the fit of the garment is not affected by taking up the side seams.

Shortening Cuffed Sleeves. Altering cuffed sleeves that are too long is more involved than the simple lengthening and shortening processes discussed in detail in this chapter. This alteration is performed on men's shirts more often than on any other garment. To correct the problem of a cuffed sleeve that is too long, the following procedure may be used:

- Determine the exact measurement of the client's arm and record what the sleeve length should be on the alteration tag.
- Pin the amount of fabric that should be taken up at the base of the sleeve but above the cuff. Make a note of this measurement on the alteration tag.
- Mark a chalk line on the sleeve to indicate the location of the new seam line.
- Remove the cuff and the placket from the sleeve.
- Place one or two rows of stitching 1/2 inch below the newly marked sleeve seam line, as shown in figure 20.5. This stitching will be used to ease or gather the sleeve to the cuff.
- Trim the excess fabric from the sleeve.
- Cut the placket opening the additional length needed for the placket to be reset. Stitch the placket back into place.
- Restitch the cuff to the sleeve edge easing or gathering as needed.

◆ *Essential Questions:* ◆
Blouse and Shirt Alterations

1. What are the basic components of a blouse or shirt that may require alteration?
2. In what ways can darts be altered to change bodices?
3. Why should sleeves be one of the last bodice areas to be altered?
4. What is a gusset? How is a gusset used to alter sleeves?



Easestitch After Removing Cuff

Reattach Cuff

Figure 20.5

SKIRT ALTERATIONS

Although there are many different styles of skirts, they are all relatively easy to alter. Skirts with unusual design lines, such as scalloped hems, decorative borders, or pleats, may require more time to alter; the alteration can usually be accomplished successfully with time and patience. Skirt alterations discussed in this chapter are as follows: increasing the waistline, decreasing the waistline, increasing the hip line, and decreasing the hip line.

Increasing the Waistline

The waistline of a skirt can be designed many different ways. If a skirt has a waistband, it may have features such as belt loops, top stitching, and some type of closure. A skirt that does not have a waistband may have these same features, but they are attached to the skirt rather than to a waistband. A waistline that is too tight pulls at the side seams and the closures of the skirt, causing discomfort. To correct the problem of a tight waistline on a skirt with a waistband, the following procedure may be used:

- Determine the client's accurate waistline measurement and write the measurement on the alteration tag.
- Mark the skirt with tailor's chalk to indicate the amount of fabric to be released.
- Move the closure on the waistband to solve the problem if the skirt is slightly tight. If the problem cannot be solved by adjusting the closure, remove the waistband and the seam tape. Removing the seam tape will allow the waistline of the skirt to stretch.
- Release waistline darts, side seams, center front seam, and/or center back seam to increase the size of the waistline. It is best not to adjust a seam with a zipper because of the amount of time involved in adding seam allowance to the zipper and restitching the zipper. It is important to remember that equal amounts of ease should be released in corresponding areas of the garment.
- Release seams as needed to provide the required amount of ease. If this procedure does not provide enough ease, the darts can be removed or made smaller as described previously.
- Stitch each new seam, tapering to the original seam line.
- Cut a new waistband from identical fabric if necessary. Using the old waistband as a guide, cut a new waistband the correct length for the new waistline seam.
- Pin the new waistband to the skirt, matching center front, center back, and side seams.
- Stitch the waistband to the skirt. Trim the waistline seam and press the new waistband.

Decreasing the Waistline

A garment that is too loose at the waist does not hang properly and does not hold its proper shape. If the garment is belted, excess folds of fabric may appear around the waistline. The same procedure for increasing the waistline is followed for decreasing the waistline, except that the side seams are taken up rather than let out. The fullness in the skirt can be taken up in the side seams, center front seam, center back seam, and waistline darts. It is not necessary to cut a new waistband. Some of the original waistband may need to be trimmed to match the smaller waistline of the skirt. As mentioned in the preceding alteration procedure, equal amounts of fabric should be taken in from corresponding areas of the garment.

Increasing the Hip Line

When a skirt is too small in the hips, it pulls at the side seams and causes gathers to form at the hip line and possibly in the abdomen area. It is relatively easy to correct this fitting problem if the seam allowances are wide enough to be let out. To alter a skirt that is too tight through the hip line, the following procedure may be used:

- Mark the side seams with tailor's chalk, indicating where the seam should be let out. Mark where the new seam should stop and taper into the original seam.
- Let out the side seams an equal amount from the hip line to the bottom edge of the skirt if the design of the skirt makes this necessary. Release the hem approximately 2 to 3 inches on either side of each side seam.
- Stitch the new seam line, tapering the new seam line into the original seam line at both the top and bottom edges of the skirt.
- Remove the original seam line where it has been replaced with a new seam line. Press the seam open and restitch the hem if it was released.

Decreasing the Hip Line

A skirt that is too large through the hip area appears too bulky, and folds of fabric may appear. This fit problem is not as noticeable or common on the female figure as skirts that are too tight. The same procedure for increasing the hip line is followed for decreasing the hip line, except that the side seams are taken up rather than let out. There will be a greater amount of fabric in the seam allowances rather than a smaller amount. This excess fabric may need to be trimmed from the hip area to reduce bulk.

◆ **Essential Questions:** ◆

Skirt Alterations

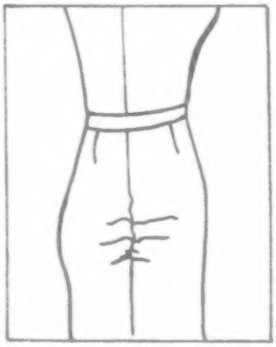
1. What skirts require extra time and patience to alter?
2. What are four examples of common skirt alterations?

SLACKS AND PANTS ALTERATIONS

Slacks and pants are altered in much the same way as skirts. The waistband and hip line are similar in both garments and require the same procedures for increasing or decreasing fullness. Slight variations of these procedures may be required when altering men's pants. For example, many of the fit problems that occur in men's pants can be solved by increasing or decreasing the center back seam. There is usually a wide seam allowance in this area of men's pants specifically for alteration purposes. The following slacks and pants alterations are discussed in this chapter: increasing fullness in crotch and decreasing fullness in crotch.

Increasing Fullness in Crotch

When slacks or pants are too tight through the crotch area, diagonal gathers form in the front and back crotch area. This can be an uncomfortable fit problem. Lowering the rise can alleviate this problem to some extent. The rise, or crotch depth, is described in Chapter Sixteen. To alter slacks or pants that are too tight through the crotch by lowering the rise, the following procedure may be used:



- Determine the amount of additional ease needed by comparing the garment measurement and the body measurement. The crotch seam should fall approximately 1/2 to 1 inch below the body. Write the amount of additional ease needed on the alteration tag.
- Check the amount of seam allowance tucked in the waistband by releasing a

small amount of the waistband before ripping the entire waistband off. Determine if there is enough extra fabric for the alteration.

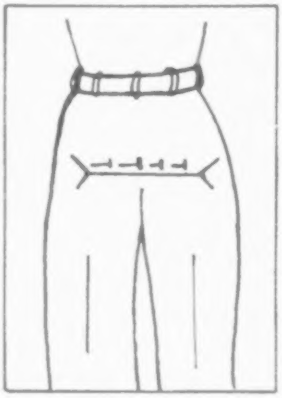
- Release the waistband from the slacks or pants in the front if the crotch is tight in the front only. If the crotch is only tight in the back, release the waistband in the back. Mark the new seam line with tailor's chalk along the upper edge of the waistline.
- Stitch the waistband back on the slacks or pants along the new waistline seam.
- Press the new waistline seam.

Another method for correcting the fit problem of a tight crotch is to stitch new seams in the crotch area. To correct slacks or pants that are too tight through the crotch by enlarging the crotch area, the following procedure may be used:

- Determine the amount of additional ease needed by comparing the garment measurement and the body measurement. The crotch seam should fall approximately 1/2 to 1 inch below the body. Record the amount of additional ease needed on the alteration tag.
- Mark the new seam line with tailor's chalk. Draw the chalk line following the shape of the center front seam and the center back seam.
- Release approximately 2 to 3 inches down all four seams that intersect at the crotch.
- Stitch the new seam lines together, adding the needed amount of ease and tapering into the original seam lines.
- Trim the new seams and press them open.

Decreasing Fullness in Crotch

When the crotch falls more than 1 inch below the curve of the body, it is too long and makes the slacks or pants look baggy. Unless the pants are designed to be baggy and have a low crotch, this fit problem should be altered. The same procedures for increasing crotch fullness are followed for decreasing crotch fullness, except that the crotch is taken up rather than let out.



A pair of slacks or pants can appear too big in the seat by hanging too far below the curve of the body. This excess fabric is tucked and pinned by the fitter as shown in the illustration. The tuck should not measure more than 1 1/2 inches if this procedure is used. The following procedure may be used to correct a pair of slacks or pants that are too long through the seat:

- Measure the amount of excess fabric in the tuck pinned by the fitter. Write this measurement on the alteration tag.
- Release the seams in the crotch area 2 inches on the center front and back seams and down to the knees on the inseams.
- Mark a new seam line on the back parts of the legs, decreasing ease the amount measured in the tuck. Because the fullness is only in the back, do not adjust the front of the pants.
- Pin the front and back pants together, matching the new seam line on the back to the original seam line on the front.
- Stitch the seams together. Trim the seam allowance as needed. Press the seam open.

◆ Essential Questions: ◆
Slacks and Pants Alterations

1. What signs indicate that crotch fullness needs to be increased? How can this problem be alleviated?
2. What signs indicate that crotch fullness needs to be decreased? How is this done?

JACKET ALTERATIONS

Many of the characteristics of a jacket are similar to those of a blouse or shirt. This section includes some of the procedures that are commonly used to alter a tailored coat or jacket. The shoulder width, neck length, sleeve length, and overall height of the client are the factors that influence the fit of a jacket. Jacket alterations discussed in this chapter are as follows: decreasing back neck fullness, decreasing shoulder width in the back, increasing shoulder width in the back, increasing fullness in the abdomen area, and decreasing fullness in the abdomen area.

Decreasing Back Neck Fullness

A jacket that does not fit the neck properly develops horizontal lines directly under the collar. This problem may be corrected by shrinking out the fullness with a steam iron and extra moisture. Shrinking out the fullness can only be successful if there is a small amount of excess fabric; otherwise, the alteration should be made at the collar. To correct the problem of fullness under the collar, the following procedure may be used:

- Pin out the extra fullness under the back collar. Measure the amount of fabric pinned out and write that figure on the alteration tag. If the measured amount is more than 3/4 inch, this alteration method should not be used.
- Separate the back of the collar from the jacket to correct a slight bulge at the collar seam line.
- Mark a new collar seam line with tailor's chalk or pins to correct a slight bulge. Measure from the old seam line the amount listed on the alteration tag.
- Remove excess fullness in the shoulder area and the back collar seam line for a more severe bulge. To remove fullness from both places, release the collar seam and shoulder seams from the neck to about 1 inch from the armseye seams. Do not release the armseye seams. Figure 20.6 illustrates the areas that should be released.
- Mark a new collar seam line and new shoulder seam lines for a severe bulge. Increase the shoulder seams to remove the same amount of fullness removed from the collar seam line. Taper each new shoulder seam to the width of the original shoulder seam where it intersects with the armseye seam.
- Restitch the shoulder seams along the new seam lines, increasing the shoulder seam allowance as needed.
- Press the shoulder seams.
- Attach the collar to the jacket using the new collar seam line marked on the jacket.
- Trim and press the new seams.

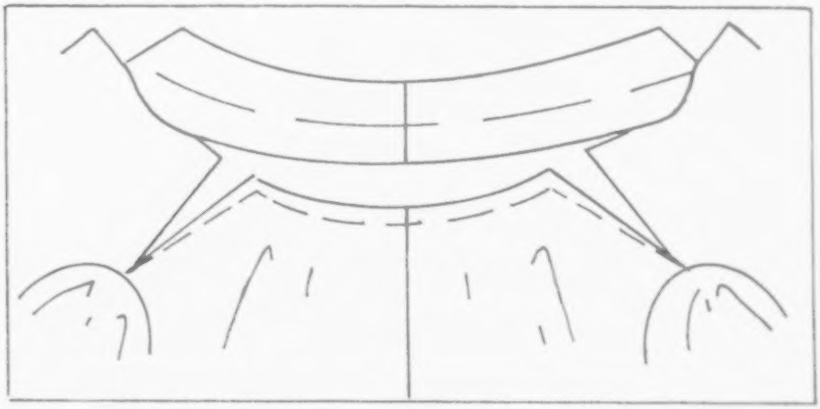


Figure 20.6

Decreasing Shoulder Width in the Back

The shoulder seams of a jacket should not extend beyond the natural shoulder more than 1/2 inch. Taking a jacket up through the center back seam corrects most shoulder fit problems. However, this alteration may need to be done in combination with decreasing shoulder width in the front if the problem is excessive. To correct the problem of too much width through the shoulders, the following procedure may be used:

- Grasp the excess fabric along the center back seam until the armhole seams move into their proper places.
- Mark the new seam line down the center back. Indicate where the new seam line should taper into the original seam line by marking an X with tailor's chalk at that point. Measure the amount to be taken up and write that figure on the alteration tag.
- Stitch the new seam along the center back, tapering the new seam into the original seam at the marked location.
- Remove the collar from the jacket and separate the upper and under collars from each other.
- Cut the collar at the center back and stitch a center back seam if the collar has no center back seam. The seam allowance should include the same amount of excess fabric taken up across the back of the jacket. Alter the upper and under collars in the same manner. Stitch the upper and under collars back together.
- Stitch the collar to the jacket.
- Trim and press the new seam open.

Increasing Shoulder Width in the Back

When a jacket is too small through the back, horizontal wrinkles form, and the center back, armseye, and side seams may be strained. The same procedure for decreasing shoulder width is followed for increasing shoulder width, except the center back seam is let out rather than taken up. The amount of fullness to be added depends on the size of the original seam allowance. The collar can be adjusted only if it has a center back seam that can be let out the amount the jacket is let out. If the jacket collar is constructed without a center back seam, a new collar must be constructed that will fit the increased size of the new neckline.

Increasing Fullness in the Abdomen Area

When a jacket is too tight around the abdomen, the fabric is strained at the buttons. This alteration involves similar procedures used to increase fullness in a bodice that is too tight around the abdomen. Buttons can be moved on a jacket about 1/4 inch to add extra ease. Usually 1 1/2 inches is the maximum amount of fullness that can be added to the front of a jacket. To add fullness in the abdomen area of a jacket, the following procedure may be used:

- Use tailor's chalk to mark the amount of fabric to be released along each side seam. Write this measurement on the alteration tag.
- Release the side seams from the hem up to the armseye seam. Do not release any of the armseye seam.
- Add extra seam allowance to the front of the jacket only if the jacket fits well in the back. However, if there is not enough seam allowance on the jacket front, some ease may be released from the back side seam allowance.
- Stitch the new seam line, tapering it from the armseye seam down to the hem.
- Trim the seam as needed and press it open.

Decreasing Fullness in the Abdomen Area

A jacket that is too large through the abdomen has an excessive amount of overlap in the front. As in the alteration procedure for increasing fullness in the abdomen area, only 1 1/2 inches can be removed from a jacket without losing the original design lines. The same procedure for increasing fullness in the abdomen area is followed for decreasing fullness in the abdomen area, except that the side seams are taken up rather than let out. Fullness should be removed from each jacket front seam allowance without decreasing fullness in the jacket back. This procedure helps preserve the original look and design lines of a jacket.

◆ Essential Questions: ◆ Jacket Alterations

1. What factors influence the fit of a jacket?
2. What are two ways of decreasing back neck fullness in a jacket?
3. What indicates that a jacket is too tight around the abdomen? too large through the abdomen?

LENGTHENING AND SHORTENING GARMENTS

As stated in Chapter Nineteen, the majority of alterations are made on the hemlines of garments. Adjusting a hem is usually a simple alteration that should be done after all other alterations on a garment have been completed. Most lengthening and shortening alterations are made at the hemline, but in some unusual situations the alteration is made at the waistline. There is usually not enough seam allowance at the waistline seam to allow lengthening a garment. However, a skirt can be shortened by removing fabric from the waistline. This alteration method is appropriate for a skirt with a special border at the hemline that cannot be changed, for example.

There are many types of hem finishes and hemming stitches that may be used for different types of garments and fabrics. These stitches and finishes are described in Chapters Thirteen and Eighteen. When altering a ready-made garment, it is best to use the same hemming stitch and hemming finish that were originally used, if possible. If the original hem of the garment is poorly done or defective, the alterationist should choose the most appropriate method for replacing the hem. If a garment is sold unhemmed, like many men's and women's tailored pants and slacks, the alterationist should select the best method of hemming for the weight and type of fabric.

Some of the most common hem alterations discussed in this chapter are as follows: lengthening or shortening an uneven hemline, lengthening or shortening the hemline of a lined garment, and lengthening or shortening the hemline of a pleated garment.

General Guidelines for Lengthening and Shortening

- Have the client stand in front of a mirror, preferably a three-way mirror. It is important to have a full-length mirror so the client can see the hem. If there is no mirror, the client may tend to bend over to see the hem, causing the hem to be marked unevenly.
- Ask the client to stand straight but not rigid.
- Have the client wear the undergarments and shoes to be worn with the garment being altered.
- Ask the client where he or she wants the hemline.
- Let the garment hang for approximately twenty-four hours after releasing the original hem. This period of time allows for any stretching that the garment may experience and is especially important for circular skirts or garments cut on the bias.
- Attach the hem so that it is not visible from the outside of the garment, unless it is a topstitched hem.
- Make sure the entire hem is the same width.

Lengthening an Uneven Hemline

The amount of fabric turned up to form the original hem determines the amount a garment can be lengthened. When a garment is lengthened, the width of the new hem will be less than the width of the original hem. A hem width and hem finish should be selected that will result in a professional looking hem. To lengthen an uneven hemline, the following procedure may be used:

- Release the hem in the garment by clipping the threads. Lightly press the hem out, brushing away any lint or other material trapped in the hem.
- Mark a line around the entire garment, using the most appropriate marking method for the type of fabric. This line indicates where the bottom edge of the garment will be.
- Determine how wide the hem should be. Mark a second line an equal distance below the first line around the entire garment. This line indicates where the hem will end.
- Trim the fabric on the line indicating where the hem ends, making the amount of fabric to be turned up for the hem exactly the same around the entire garment.
- Turn up the bottom edge of the fabric on the line indicating where the bottom edge of the garment will be. Stitch the hem in place using the most appropriate method of stitching.
- Press the hem as needed.

Shortening an Uneven Hemline

The same procedure for lengthening an uneven hemline is followed for shortening an uneven hemline, except that the hemline is taken up rather than let down. Also, when shortening a hemline, more fabric will be trimmed from the bottom edge of the garment to even the hemline and reduce bulk. As much fabric as needed can be reduced from the hemline. As the hemline is altered, the proportions of the garment change. For example, a full length formal gown may look inappropriate if hemmed to the knee or to street length.

Shortening the Hemline of a Lined Garment

Many types of garments are lined. As stated earlier in this chapter, garment linings must be altered along with the garment if a professional, well-fitting look is desired. The corners of lined garments should be treated with extra care. The facings in a garment may be fitted facings, or the garment may have self-facings. When altering a garment with either self-facings or fitted facings, there may be additional bulk and some hand stitching may be required.

Garments such as coats, skirts, and dresses usually have free-hanging linings that hang from the garment's waistband or shoulders and are attached by French tacks at the hemline. Garments such as jackets and vests usually have linings that are sewn securely into the garment's edges. These linings are called attached linings. Altering the length of a suit jacket is not advised because of the curves and design lines being adversely affected. The following procedure describes an alteration appropriate for shortening the hemline of a garment with a free-hanging lining:

- Separate the garment from the lining and release the hems of both the garment and the lining.
- Mark the new hemline on the garment with basting stitches. It is best to use a long-lasting method of marking since this alteration requires time and pressing to complete.
- Release the lining from the vertical facing approximately 4 inches along the opening of the garment. Example openings in garments are the center front of a coat and the slit in the back of a skirt. The amount of facing to be released depends on how

much the garment needs to be shortened. Press the original hem creases out.

- Trim any excess fabric from the hemlines.
- Apply an appropriate hem finish to the new edge of the garment and the lining.
- Turn the garment hem up along the basting stitch that indicates the new bottom edge of the garment. Stitch the hem in place using an appropriate stitch.
- Turn the facing fabric back on its original vertical crease as indicated in figure 20.7.
- Hand stitch the facing and the lining together along the vertical seam. It is not necessary to stitch the lining along the hemline. Tack the lining to the garment with French tacks to hold it in place.

Lengthening the Hemline of a Lined Garment

The same procedure for shortening the hemline of a lined garment is followed for lengthening the hemline of a lined garment, except that the hem is let down rather than taken up. The possibility of performing this alteration depends on whether or not the hem is deep enough to lengthen the amount needed while also keeping enough depth in the hem. If the lining is an attached lining, separate the lining from the garment's edges to see if there is enough hem to lengthen the garment.

Shortening the Hemline of a Pleated Garment

Skirts or dresses that are pleated can be altered from the waistline or the hemline. Because the waistline alteration is less common and has been previously described, this procedure explains shortening a pleated garment at the hemline. A skirt, dress, or coat may have pleats strategically placed for design or for ease, or the entire garment may be pleated. More marking is usually required on pleated garments than on other garments in order to achieve an accurate hemline. For example, it may be necessary to mark on both sides of each knife pleat on a skirt so the new hemline will be even. To shorten the hemline of a pleated garment, the following procedure may be used:

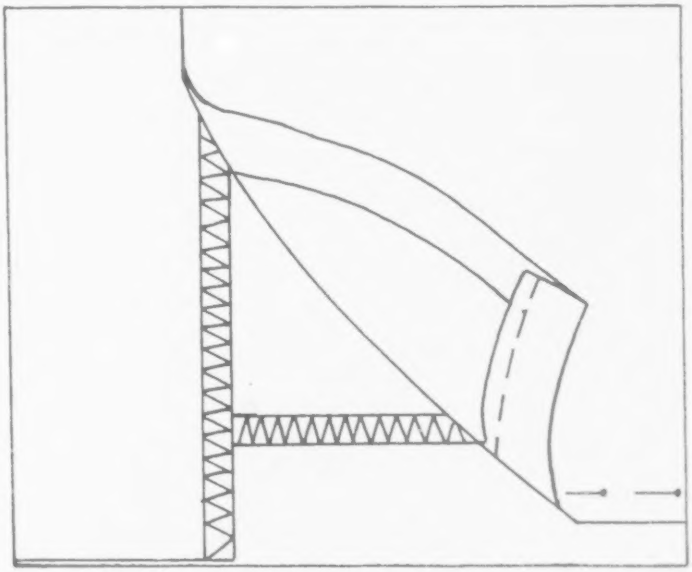


Figure 20.7

- Mark the new hem on the garment using the most appropriate marking method. This line will become the bottom edge of the garment.
- Release the original hemline of the garment and press the crease out. Release any pleats that are sewn or tacked to the garment. Release any seams within pleats the amount required to shorten the garment.
- Trim any excess fabric from the hemline.
- Stitch any seams within pleats back to their original positions.
- Turn the hem up on the new hemline and stitch the hem in place using the most appropriate method of stitching.
- Press the hem as needed.
- Press the pleats carefully using pressing procedures described in Chapter Fifteen.

Lengthening the Hemline of a Pleated Garment

The same procedure for shortening the hemline of a pleated garment is followed for lengthening the hemline of a pleated garment, except that the hem is let down rather than taken up. As in all lengthening procedures, the amount of alteration allowed depends on how deep the original hem is. The new hem should have enough depth so that it looks neat and professional. Some pleated skirts, especially knife pleated skirts, may only have a shirttail hem or a rolled hem that cannot be lengthened.

◆ **Essential Questions:** ◆
Lengthening and Shortening Garments

1. In what two places can lengthening and shortening alterations be made?
2. What are five general guidelines for lengthening and shortening garments?

ALTERING CHILDREN'S GARMENTS

Children's garments are generally easier to alter than adults' garments because a child's body has fewer curves to fit. Most alterations are not made to improve the fit of a child's garment but to increase the wearability or lifespan of the garment. Since children grow rapidly and are not able to wear garments very long, performing complicated alterations on children's clothing is not usually recommended. Some children's clothing manufacturers use design features that allow a garment to be altered and worn longer. It is economically beneficial to buy children's garments with the following types of features:

- deep hems
- cuffed pants
- adjustable straps
- elastic waistlines
- extra buttons on straps

◆ **Essential Questions:** ◆
Altering Children's Garments

1. What is the most common reason for making alterations to children's garments?
2. What features are economically beneficial in children's garments? Why?

Chapter Highlights

- A person trained to view garments on the client, make fitting suggestions, determine what changes are possible, and mark the garment is called a fitter. An alteration tag is used to record alteration instructions.
- Standard symbols are used in marking garments for alterations.
- When a lined garment is altered, the lining should be altered in the same manner as the garment.
- A dress is usually comprised of a skirt and a bodice and can be altered according to the procedures described for these garments. The waistline seam is a unique feature of a dress and can be increased, decreased, raised, or lowered.
- The primary parts of a blouse or shirt that can be altered are the neckline, shoulders, bodice, and sleeves.
- One of the primary techniques for changing bodices is through the use of darts. Darts may be added, removed, relocated, or increased or decreased in size.
- Skirts can be altered at the waistline or at the hip line.
- Some alterations made to slacks and pants are like those made to skirts. In addition, the crotch area of slacks or pants may be altered to increase or decrease fullness.
- Alterations may be made to jackets to adjust back neck fullness, shoulder width, and fullness in the abdomen area.
- It is always best to purchase a garment that fits well in the neck, shoulders, and chest areas because altering these areas is sometimes difficult while altering the lower portion of a garment is relatively easy.
- The majority of alterations are made on the hemlines of garments. In some situations, alterations are made at the waistline. Lengthening or shortening is usually a simple procedure done after all other alterations are completed.
- Children's garments are usually altered to accommodate the growth patterns of children.
- It is economically beneficial to buy children's clothing with built-in features for lengthening, shortening, and expanding.

Chapter 21

Laundry and Dry Cleaning Procedures

Chapter Focus

The following Essential Knowledge and Skills are discussed in this chapter:

7A Define terms commonly used in commercial textile and apparel care.

7D Identify equipment and supplies and their uses in textile and apparel care.

7E Demonstrate proper selection, use, and care of equipment and products for cleaning, laundry, and pressing tasks.

7F Perform commercial care procedures for textile and apparel products in accordance with content and care label information.

7H Complete commercial textile and apparel care tasks according to industry standards.

Chapter Vocabulary

- blocking
- break
- bulk cleaning
- button traps
- chemical energy
- dispersing
- dry cleaning
- dry side chemicals
- emulsifiers
- enzyme
- flushing
- mechanical energy
- sequestering
- solvent
- sorting
- spotters
- tamping
- thermal energy
- wet side chemicals
- wetting

Read chapter sections for additional terms related to laundry products and laundry equipment.

The goal of laundry and dry cleaning employees is to remove soil and provide customers with clean textile and apparel products. When choosing the most appropriate method for removing soil, employees should consider characteristics of the items being cleaned and follow instructions on care labels.

Textile and apparel products can be damaged when inappropriate cleaning methods are used. For example, if items are not checked for colorfastness, they may bleed and damage other items. Additional characteristics to be considered when cleaning textile and apparel products include the following:

- fiber content
- yarn structure
- fabric construction
- garment design and construction
- fabric finish(es)
- type of trim
- type and amount of soil

Employees should also have a thorough knowledge of laundry and dry cleaning equipment and products. Proper use of equipment and supplies can eliminate damage to textile and apparel products.

COMMERCIAL LAUNDERING

Procedures and techniques used in commercial laundries to launder textile and apparel products are similar to laundering procedures used in the home. Items are sorted, stains are removed, and items are washed and dried. However, the equipment used in commercial laundries differs from home laundry equipment. The large amount of items laundered in a commercial laundry requires the use of large, commercial laundering equipment.

In order to properly launder a customer's textile and apparel products, it is important for an employee to understand various aspects of laundering such as the following:

- correct use of various types of laundry products
- procedures for properly sorting laundry
- techniques for removing stains
- operation of laundry equipment

Laundry Products

Laundering not only cleans but also removes odors, reduces wrinkles, restores a fresh appearance, and preserves the lives of textile and apparel products. In order to achieve these results, appropriate laundry products must be selected and used. Suppliers usually provide information on ingredients, proper application, and safe use of products. In addition, many suppliers or manufacturers also offer training sessions regarding the use and application of their products.

Each laundry employee must be thoroughly trained in the correct use of laundry products. The amount of a laundry product used is just as important as the type of product used. The amount of detergent, bleach, or other product is determined by the size of the load and the amount of water used in the wash cycle. Effective results can usually be achieved by following the manufacturer's recommendations.

Some laundry products contain a combination of ingredients, while other products must be mixed to achieve effective results. Some laundry products become dangerous when combined. Other products come premixed and packaged in properly proportioned amounts for easy and safe use. Knowledge of laundry products and laundry product ingredients is important not only to achieve the most effective use of a product but also to assure the safety of the user.

Products used to launder textile and apparel products should be tested regularly to determine the pH level. The ***pH level*** indicates the acidity or alkalinity of a solution. A pH value of seven is neutral. Values from zero to seven indicate acidity, and values from seven to fourteen indicate alkalinity. If the pH level of a laundry product is too high or too low on the scale, items may become discolored and skin irritation can result. A kit that determines the pH level in the final rinse water can be purchased and used to test laundry products.

Guidelines to observe when using laundry products include the following:

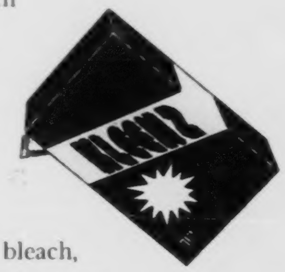
- Use enough laundry product to effectively clean laundry. Poor results are achieved when an insufficient amount of laundry product is used.
- Add extra laundry product when hard water or heavy soil is present, large loads are washed, or wash water is cool.
- Use detergents rather than soap in hard water. Soap reacts with the minerals in hard water to form a soap curd that makes apparel and textile products appear dull and dingy.
- Use either soap or detergent in soft water.
- Use hot water when possible. All detergents, even those designed to work in cold water, give better results when used in hot water.
- Read all package directions and measure precise amounts, especially when using bleach.
- Dilute bleach and fabric softeners before adding to wash or rinse water to avoid staining or discoloring apparel and textile products.

Presoak Products. A ***presoak product*** is used to create a solution in which stained items are soaked before being laundered. Presoak products contain enzymes or oxygen bleach. An ***enzyme*** is a substance that speeds up a chemical reaction. Enzyme presoaks aid in breaking down complex soils, especially proteins such as egg and blood, so these soils can be more easily removed by other detergent ingredients during the laundering process. Presoaks can also be placed directly on stains.

Soaps. ***Soap*** is a mild cleaning product made by combining a strong alkali, such as lye, with animal fat. An ***alkali*** is a soluble substance that neutralizes acids. Soap should only be used as a laundry product when washing with soft water. When soap combines with minerals found in hard water, a soap curd is produced.

Soap curd is a sticky yellow or white crust that deposits on fabrics and washing machines. Soap curd deposits cause textile and apparel products to appear dull and dingy. When soap is used in hard water, a water softening agent should be added to both wash and rinse waters to help prevent soap curd deposits. When used alone, soaps are too neutral to provide effective cleaning power. However, they can safely be used to pretreat stains and hand wash delicate fabrics.

Detergents. Laundry detergents are available in many different types and forms. Each type contains basic ingredients that perform specific tasks during the washing process. Detergents may contain surfactants, builders, dyes, bleach, softeners, antiredeposit agents, and suds control agents.



A ***surfactant*** improves the wetting ability of water, loosens and removes soils with the aid of mechanical action (such as washer agitation or manual scrubbing), and dissolves or suspends soils in the water so they are not redeposited on fabrics. High-sudsing surfactants are particularly effective in the removal of oil and dirt.

A ***suds control agent*** is used in laundry detergents to control the amount of suds produced during the washing process. Low-sudsing detergents were originally designed for use in tumble-type automatic washers where excess suds interfered with the cleaning action of the washer.

Builders increase the efficiency of cleaning agents by tying up or inactivating minerals in hard water. All granular laundry detergents and some liquid laundry detergents contain builders. Phosphate, an alkali, is used as a builder. Phosphate has the ability to sequester (surround and seize) water hardness minerals and hold them tightly in solution. Phosphates aid in the removal of soils and keep them from redepositing on fabrics.

In some geographical areas, phosphates are banned because it is believed they contribute to the eutrophication of streams and rivers. ***Eutrophication*** refers to increased levels of nutrients in a body of water. An increased level of nutrients causes the rapid growth of algae. As algae decays, oxygen levels in the water decrease, and fish die. The eutrophication process can be reversed by properly treating and disposing of waste water and reducing runoff.

The amount of detergent used depends upon water softness. Commercial laundries using hard water may choose to mechanically soften water, increase the amount of detergent used, or add water softeners during the washing process. Decisions regarding water softness are usually made on the basis of cost-effectiveness.

Bleaches. ***Bleach*** is a laundry product used to whiten, remove stains, remove oily soils, deodorize, and disinfect. Both chlorine and oxygen-based bleaches are available in liquid or powder form.

Chlorine bleach is available in liquid or granular form and can be used on all washable, colorfast cotton and permanent-press fabrics. Chlorine bleach should always be diluted. When chlorine bleach is not diluted, color may be removed from fabrics or fabrics may be weakened. Chlorine bleach may cause fabrics to discolor if an excessive amount of iron is present in the water supply. Some fabrics may have a chlorine retentive finish. These fabrics can turn yellow when chlorine bleach is used in the washing process. A packaged color remover must be used to remove yellowing.

Oxygen-based bleach provides bleaching action for stain and soil removal and can be used on all colored, washable fabrics. Oxygen bleaches usually contain other cleaning ingredients such as water softeners, enzymes, and fabric whitening agents. Oxygen-based bleaches are milder than chlorine bleaches and work best in hot water or in a soak. Chlorine and oxygen-based bleaches should not be mixed. When mixed, the actions of the bleaches counteract each other and effective results are not produced.

Bluing is a liquid or powder added to laundry solutions to prevent white fabrics from yellowing. Laundry detergents often contain bluing formulations that add a desirable blue-white color to white fabrics. Most detergents contain ***fluorescent whitening agents (FWAs)*** rather than bluing. FWAs are complex organic molecules that adhere to fabrics as a dye would. They absorb unseen ultraviolet rays from the sun or fluorescent light sources and convert this energy to visible light to enhance fabric appearance and maintain whiteness or brightness. FWAs are found in presoaks, liquid fabric softeners, detergent boosters, and oxygen bleaches.

When using bleach, the following guidelines should be observed:

- Read directions and measure bleach accurately.
- Do not pour bleach directly on laundry.
- Dilute liquid chlorine bleach with water before adding to agitating laundry.
- Do not combine undiluted chlorine bleach and undiluted liquid detergent. Harmful fumes may be produced.
- Avoid adding chlorine bleach and enzyme detergent to wash water at the same time. Chlorine bleach inactivates enzymes.
- Do not mix chlorine bleach with ammonia or acids such as vinegar or rust remover.

Mixing chlorine bleach with acid can produce a toxic gas that may cause death.

- Bleach an entire item rather than only stained areas so any color change will be less noticeable.

Fabric Softeners. A ***fabric softener*** is a product that is used during the laundry process to give laundry a soft, smooth feeling, to make pressing easier, and to prevent static electricity. Fabric softeners also add a pleasing fragrance to laundered articles and reduce wrinkling. Fabric softeners are available in liquid form, saturated paper or fabric sheets, and packets.

Liquid fabric softeners are added directly to the final rinse. Many washing machines have dispensers that automatically dispense fabric softener. Fabric softener should not be poured directly on fabrics since staining will occur. Fabric softener stains can be removed by wetting the stain and rubbing with bar soap.

Sheet or packet fabric softeners may be placed in the dryer with laundry. At high temperatures, sheets or packets can cause staining. For example, fabric sheets almost always stain silk fabrics and thus should be avoided with silks. If fabric is accidentally stained, wet bar soap can be applied to remove stains.

Starches. ***Starch*** is used to give body to fabrics made of natural fibers, increase resistance to soiling, and make pressing easier. Starch is available in liquid, spray, or powder form. Starch is often added to the washer during the final rinse cycle or applied before or during pressing. Dry or liquid starch is mixed with hot or cold water. In commercial laundries, a special washer is often used for applying starch.

Prelaundry Procedures

Sorting. ***Sorting*** is the process of separating items to be washed into groups that can be washed together safely. Textile and apparel products should be sorted into a minimum number of categories. Too many categories result in small loads and underfilled washing machines. However, too few categories result in large loads that lower the quality of each washing. The sorting method used in a commercial laundry should help the work proceed quickly and efficiently.

Items are often sorted according to the following characteristics:

- color - Dark and light colored items should be laundered separately since dark colored items can bleed and damage light colored items.
- soil - Heavily soiled items should be laundered separately from moderately or lightly soiled items to ensure that the soil is adequately removed.
- size - Items of similar size should be laundered together to prevent heavy items from damaging delicate items.
- texture - Items that shed lint, such as towels, should not be washed with items that collect lint, such as fabrics made of manufactured fibers, permanent-press fabrics, and napped fabrics such as corduroy and velveteen.

Items are also sorted according to the type of handling required following the laundry process. For example, laundry could be sorted into categories such as the following:

- items that will be removed from the washer and ironed dry
- items that will be tumbled dry
- items that require starch

As laundry is sorted, employees should check pockets, close zippers, fasten closures such as buttons and snaps, and remove ornamentation. Adequately preparing items for laundering helps prevent damage such as snagging. Some commercial laundries require employees to repair damaged items before laundering. Damage that is not repaired can ravel and become worse during the washing process. Employees should be familiar with procedures for repairing textile and apparel products. Further information regarding the repair of apparel and textile products is included in Chapter Thirteen.

General guidelines to observe when sorting laundry include the following:

- Sort laundry on a table or counter to save energy and time.
- Wash like items together to prevent tangling and excess wrinkling and to control load weight.
- Wash white, brightly colored, colorfast, and noncolorfast items separately.
- Wash heavy, bulky items such as blankets and bedspreads by themselves.
- Do not wash colored fabrics with lint shedding fabrics. Lint is difficult to remove from colored fabrics.

Stain Removal. Any item that is stained or heavily soiled requires special treatment before being laundered. Soiling means to make dirty. ***Stains*** are soiled or discolored spots. Identification of a stain is necessary before the correct treatment can be applied. Immediate action is also important in removing stains. Three basic methods used to treat stains are soaking, pretreating, and stain removal.

Many stains can be removed by soaking them in a basin, laundry sink, or washer filled with warm or cool water and a presoak product containing enzymes. Hot water should not be used since it tends to set protein stains. Soaking is effective in removing stains such as egg, baby formula, chocolate, grass, blood, and body soil. The soaking time depends on the type of fabric, the age of the stain, and the amount of stain. Most items should be soaked at least thirty minutes, but problem stains can be soaked overnight. Soaking is recommended for heavily soiled, yellowed, or grayed fabrics. Excess solution should be removed from soaked items before items are laundered. Small, greasy areas can be presoaked using a degreaser solution or spray prior to washing.

Pretreating is an effective way to treat small stains, soil inside cuffs and collars of uniforms, and grease spots on permanent-press fabrics. When pretreating, stain remover should be applied to the back of a stain rather than the front. This method helps push the stain off of the surface rather than force it into the fabric.

Stain removal involves removing stains before items are laundered. Laundry employees should be familiar with a variety of fabrics and should have access to a stain removal guide and stain removal kit. A ***stain removal kit*** contains treatment solutions such as enzyme treatment, neutral detergent, nonflammable dry cleaning solvent, ammonia, denatured alcohol, white vinegar, and rust remover; clean, white towels; a putty knife; and a soft-bristled scrub brush. Employees should receive training regarding the effective use of stain removal techniques.

Before removing a stain, the cause of the stain should first be determined. This is important since different methods are used to remove different types of stains. It is important to begin working slightly outside the stain and work in a circular motion toward the stain's center. This prevents the stain from spreading. A blotting motion rather than a rubbing motion should be used since rubbing motions can damage fabric. Overwetting should be avoided since this may cause fabric to shrink. Once the stain is removed, the same procedure should be used to rinse the fabric with clear water. After rinsing, the fabric should be allowed to air dry. If the stain is not completely removed, the procedure should be repeated. Once a stain is removed, the fabric should be laundered. Most stains can be removed following this procedure. Methods for removing common stains from washable fabrics are included in table 21.1.

Stain Removal Chart for Washable Fabrics	
Stain	**Removal**
Deodorant Perspiration Urine	Sponge with detergent. Launder in water temperature and bleach appropriate for the fabric type. Color may or may not be restored by sponging fresh stains with ammonia and old stains with vinegar. Dilute ammonia with an equal amount of water if used on wool, mohair, or silk. Rinse.
Fabric Softener	Rub black spots with detergent and launder. For a gray or bluish buildup, soak in detergent and bleach appropriate for the fabric; launder.
Fingernail Polish	Sponge white cotton fabric with nail polish remover. Sponge other fabrics with amyl acetate (banana oil). Launder. Repeat if necessary.
Fruits Juices	Sponge immediately with cool water. If safe for fabric, pour boiling water through stain. Work detergent into stain; rinse. Bleach safe for fabric type may remove final traces.
Grass	Work detergent into the stain and rinse. If colorfast, moisten with alcohol. If colorfastness is questionable or fabric is acetate, dilute alcohol with two parts water.
Laundry Product	Soak in one part vinegar to four parts water in a plastic container.
Mildew	Moisten with lemon juice and salt, if safe for fabric, and allow to dry in the sun, or sponge with hydrogen peroxide.
Mud	Let dry and brush. Soak in cold water with detergent. For iron clay soils, remove the same as rust. If stain remains, sponge with alcohol.
Mustard	Work glycerine into stain. Rinse. Launder. Prolonged soaking may be necessary. If stain remains, sponge with alcohol.
Paint Varnish	Treat the stain before it dries, if possible. Sponge with thinner solvent recommended on the label, turpentine, or trichloroethane. While still wet with solvent, apply detergent and soak. Launder. Repeat if necessary. Stain may be impossible to remove.
Rust	Sprinkle salt on the stain and moisten with lemon juice if safe for fabric. Dry in the sun and rinse. Repeat if necessary. Commercial rust or color removers may be used as directed. Do not use chlorine bleach.

Table 21.1

Stain Removal Chart for Washable Fabrics	
Stain	**Removal**
Adhesive Tape Chewing Gum Rubber Cement	Harden by rubbing with ice. Remove excess gummy matter carefully with a putty knife. Remove remaining stain with a safe cleaning fluid.
Asphalt Tar	Pour trichloroethane through the fabric. Repeat. Rinse and launder. Some stains may be impossible to remove.
Beverages (alcoholic and soft drinks) Perfumes	Sponge with cool water and glycerine. Soak 30 minutes. Treat with detergent. Sponge with alcohol if safe for fabric.
Blood Carbon Paper (regular) Pencil (lead)	Sponge with cool water. Soak 30 minutes. Rub liquid detergent into area; rinse. If stain remains, apply a few drops of ammonia and repeat detergent treatment. Lead pencil may be removed from some fabrics with a soft eraser.
Butter Chocolate Cosmetics Cream Gravy Grease Mayonnaise Milk Oil Ring-around-the-collar Sauces Shortening Smoke Soot Vomit Wax	Soak stain in cold water for 30 minutes. Rub liquid detergent into stain. Rinse and dry. If stain remains, sponge with a safe cleaning fluid and dry. Repeat if necessary.
Candle Wax Paraffin	Scrape excess off surface and place fabric between several layers of paper tissue and press with warm iron. Remove remaining stain with a safe cleaning fluid, bleach appropriate for the fabric type, or ammonia.
Candy (nonchocolate) Catsup Coffee Egg Tea (no cream) Vegetables	Sponge stain with cold water. Soak for 30 minutes in detergent. Sponging with vinegar followed by alcohol or bleach appropriate for the fabric may remove final traces.
Carbon Paper (duplicating) Ink (ballpoint)	Sponge with alcohol. If stain remains, sponge with safe cleaning fluid.
Crayon	Scrape off excess. Sponge detergent onto stain. Rinse and dry. If stain remains, sponge with safe cleaning fluid.

Table 21.1-continued

Stain Removal Chart for Washable Fabrics	
Stain	**Removal**
Scorch	Work detergent into stain immediately. Rinse. If stain remains, apply hydrogen peroxide and ammonia. Rinse. Severe scorching damages fabrics and cannot be removed.
Shoe Polish	Work detergent into stain and rinse. Sponge with alcohol and rinse. Apply safe cleaning fluid or turpentine. Depending on the kind and color of polish, several methods may need to be used.
Yellowing	Wash in hot water with an increased amount of detergent and as strong a bleach as is safe for the fabric. Prolonged soaking may be necessary. Use a color remover on white fabrics.

Table 21.1-continued

Before using a stain remover, it should first be tested on an inconspicuous area of the fabric. The following procedure can be used to test stain removers:

- Apply the amount of stain remover recommended on the package.
- Allow the stain remover to remain on the fabric sample for the recommended amount of time.
- Rinse the stain remover from the fabric.
- Examine the area and look for any change in color or texture of the fabric. If any changes appear, do not use the stain remover on the fabric.

Some stains remain on fabrics even after presoaking and applying stain removal products. These stains may be removed by either flushing or tamping. ***Flushing*** is the pouring of water or another stain removal liquid over a stain in an effort to release the stain from the fabric. Flushing removes both stains and stain removal products that were unsuccessful. ***Tamping*** is the use of a soft, densely bristled brush to brush a stain out of fabric. Light brushing action should be used (the brush bristles should not bend) to prevent damage to fabric.

The Washing Process

Three forms of energy are necessary to remove soil from fabric: mechanical, chemical, and thermal. ***Mechanical energy*** is supplied by the washing action of the washing machine. ***Chemical energy*** is supplied by bleach, detergents, and other laundry products. ***Thermal energy*** is supplied by warm or hot water. If one source of energy is reduced, one of the other sources of energy must be increased to maintain the same level of laundering performance.

Mechanical Energy. Mechanical energy is provided by the rotation of the agitator or tub. Agitation is necessary for cleaning, but too much agitation can result in damage to fabrics and the construction of textile and apparel products. Most washers offer a choice of agitation speeds. The types of fabrics being washed determine whether the agitation speed should be normal or slow and gentle. Agitation speed, load size, water level, and operation time can increase or decrease the effectiveness of mechanical energy.

Mechanical energy or the length of the wash cycle can be increased to compensate for reduced water temperature (thermal energy). Increased wash time, however, can reach a point of diminishing return and can increase fabric abrasion.

Chemical Energy. Chemical energy can be increased by pretreating, soaking, and adding more laundry product. In some geographic areas, detergent effectiveness has been reduced because of laws banning the sale of phosphate detergent. Removing phosphates reduces the effectiveness of detergents.

The following four basic processes dissolve and remove soil:

- ***wetting*** - Wetting is the first step in cleaning. By itself, water tends to form droplets and rest on top of the surface without penetrating soil. Laundry products contain a surface active agent (surfactant) which makes the water spread out evenly and allows the cleaning solution to get in between the soil and the surface. This process loosens and removes the soil.
- ***emulsifying*** - Fats, oils, and greasy soils are difficult to dissolve. ***Emulsifiers*** are chemicals that break fats, oils, and greasy soils into tiny particles so they can be easily removed from the surface and kept suspended in the wash solution until rinsed away. Emulsification is the action of an alkali or soap which breaks up the globules of grease and oil into very small particles and keeps them separated so that they do not reform into a solid group until they are rinsed out of the load.
- ***dispersing*** - Dispersing is similar to emulsifying, but dispersing breaks up solid soil and keeps it finely divided and suspended until it can be rinsed away. Solid dirt such as carbon, dust, earth, and clay is difficult to remove from fabrics. Solid soil firmly holds onto the fabric and is often ground into it. Water alone will not remove solid soil, but soaking in soap and water gradually lifts soil off and suspends it. This action is very slow, but it is speeded up by mechanical action and the use of alkalies. Alkalies prevent the dirt from being redeposited.
- ***sequestering*** - Sequestering is a chemical reaction that overcomes the effect of the minerals in water. Certain laundry products have the ability to sequester certain water minerals that otherwise would prevent other laundry product ingredients from dissolving and removing soil.

The start of the washing cycle is one of the most important operations in the wash formula. The start of the washing cycle is often referred to as the break. The ***break*** is the filling of the tub with water to proper levels. Alkalies may be added during the break to increase soil removal. The higher the temperature on the break, the faster the washing action. Breaks usually run from five to ten minutes. A properly executed break will remove approximately 60 percent of the soil from fabrics.

Water levels influence the level of cleaning power. If the wash formula calls for a water level of 6 inches and the machine is actually filling with 8 inches of water, the concentration of laundry products is diluted and the cleaning power is diminished. If the water level changes, the wash formula should also change.

Bleaching is done when light, running suds are in the wash water. Suds slow the bleaching action until the bleach has a chance to become evenly distributed throughout the load. Bleach is selective and immediately attacks dirt. If there is considerable soil left in the load and little suds, the bleach will not distribute evenly. With the correct hot water temperature and pH level (10.2-10.5, which is alkaline), a five to ten-minute bleach cycle is sufficient. The effectiveness of a bleach cycle depends on the water temperature and level of alkalinity.

Rinsing is a matter of dilution. Rinsing for three minutes after the water level is obtained is usually a sufficient amount of time. Rinsing any longer than this wastes time. Alkalies in detergents speed up the rinsing process.

The chemical energy of detergents can be understood by visualizing a single detergent molecule. The shape of this molecule can be compared to a balloon on a stick. It has a round head and a rod-like tail. The balloon, or head, loves water and dives in to immerse itself. However, the stick, or tail, hates water and tries to escape it by sticking out into the air or attaching itself to anything other than water, such as the side of the washer, dirt particles, or fabric. Millions of these molecules become active when detergent is added to wash water.

As the water is agitated, the molecule tails, which have become attached to the soil particles, literally pull the soil away from the fabric. The clean fabric surfaces then quickly attract the water-hating tail of more molecules trying to escape the water, and these pull more soil away from the fabric. The dirt particles and the clean fabric become covered entirely with molecules, their heads facing the water. Since the heads repel each other, the dirt and the fabric have no desire to make contact. The dirt particles remain suspended until rinse water flushes them away and leaves the fabric clean. Similar chemical action takes place when suds are applied to any hard surface or to the body. Oil and dirt particles are pulled away from the surface or skin, surrounded by molecules that repel each other, and floated away by rinse water.

Thermal Energy. Water temperature is an important factor affecting the laundry process. Water temperature helps to determine how clean and how wrinkled fabrics become during washing. Correct water temperature can also ensure the durability of a fabric finish and control the amount of fading caused by washing. Textile and apparel products can be washed in hot, warm, or cold water. Increased water temperatures generally result in increased soil removal.

Hot water cleans quickly and sanitizes, but it is not suitable for all fabrics. For proper laundering performance, a water heater should be set to deliver 140°F water at the tap. At this setting, the wash water in an automatic washer with the controls set on hot will be approximately 130°F with 10° lost as a result of the cooling effect of the washer components and items in the tub.

White fabrics, light colorfast fabrics, and heavily soiled permanent-press fabrics should be washed in hot water (130°-160°F or 54°-71°C) using heavy duty, all-purpose detergent. Hot water is essential in removing oily and greasy soils. After several washings in reduced water temperatures, heavily soiled or white fabrics may become yellow or gray and dingy looking.

Warm water reduces fading, preserves permanent-press finishes, and reduces wrinkling and shrinkage. Warm water is a mix of half hot and half cold water. The temperature of warm water is about 100°F. While some loads of heavily soiled items may require a hot water wash, the majority of loads can be washed effectively in warm water when proper laundry procedures are followed. Colored fabrics, lightly soiled fabrics, permanent-press fabrics, and noncolorfast fabrics should be washed in warm water (90°-110°F or 32°-43°C) using a mild detergent.

Cold water does not clean as well as hot water, but it reduces the wrinkling and fading of fabrics and saves energy. The temperature of a cold water wash is usually about 60°F. Since cleaning performance is minimized in a cold water wash, a liquid detergent or a predissolved powder detergent should be used. In water temperatures below 60°F, detergents are virtually ineffective - they do not work. Oily soils are not emulsified and they redeposit on laundry causing laundry to remain soiled.

The thermal energy of warm or cold water temperatures can be supplemented somewhat by increasing the amount of detergent used, by bleaching (if possible), and by presoaking or pretreating stains. The cost of additional detergent and bleaches used in cold and warm water washing may be greater than the cost savings gained from using the lower wash temperature.

To conserve energy, the coolest water temperature available that still produces desired results should be used. In addition, laundry should be rinsed in cold water. A cold rinse is effective in rinsing laundry washed in any temperature.

Laundry Equipment

Commercial laundry equipment is similar to laundry equipment used in the home. The main differences between commercial laundry equipment and home laundry equipment are the size and load capacity. ***Load capacity*** is the amount of laundry a washer or dryer can thoroughly wash or dry. Load capacity is measured by pounds and varies among machines. For example, a home washing machine typically holds from twelve to sixteen pounds of laundry. In comparison, a commercial washing machine can have a load capacity as high as 600 pounds.

Commercial Washers. Commercial washers clean laundry by using a combination of mechanical agitation and detergent action. Water motion is created in the inner tub of the washer causing fabrics to bend, flex, and scrub against each other as a detergent solution is forced through them.

A common type of commercial washer is the front loader. A ***front loader*** is a washing machine that is loaded from the front rather than the top. Front loaders have extensions called ***baffles*** on the inside of the inner tub. Baffles help move laundry as it tumbles. Front loaders use the principle of gravity to tumble laundry repeatedly. During tumbling, a detergent solution moves through the wet laundry and picks up, dissolves, and removes soils as the laundry rubs together. The inner tub of the front loader moves in a clockwise direction and then reverses to a counter clockwise direction. Laundry falls once it reaches the top of the tub. This differs from the top loading washing machine found in the home in that the top loader agitates laundry back and forth. An example of a front loader washing machine is shown in figure 21.1.

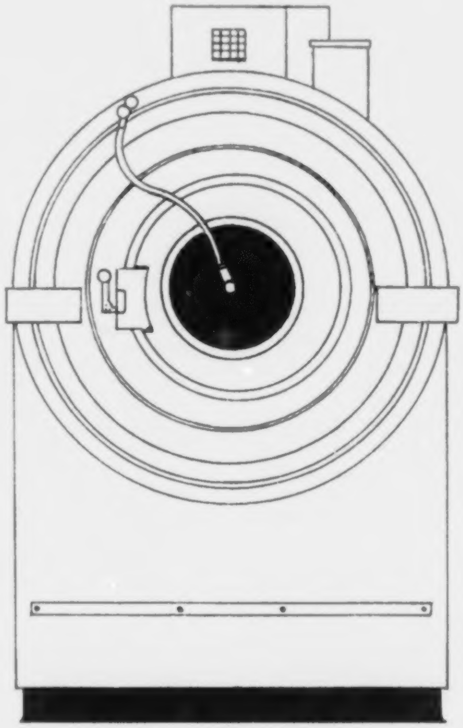


Figure 21.1

There are two basic ways that washers measure the amount of water filling the tub. In some washers, the water runs for a certain amount of time and then turns off. This method is known as ***time fill***. If the water pressure is low or inconsistent, the water may not always reach the desired level needed to wash effectively. Washers also use the ***pressure fill*** method. In the pressure fill method, water continues to run into the tub until it reaches a desired level. When the desired level is reached, the water turns off. Since the same water level is always reached, the pressure fill method is more effective and is the method currently used by most commercial washers.

Most commercial washers have a variety of cycles from which to choose. A ***cycle*** is an automatic series of steps through which a washer goes in order to wash a load effectively. A standard cycle starts when water enters the tub. Laundry is then agitated or tumbled, and the wash water is extracted. More water is used to rinse the laundry. Many washers use a spray rinse followed by an agitated deep rinse and an additional spray rinse. After the rinse, water is extracted. ***Extraction*** is the process of spinning, draining, and squeezing water out of laundry. When the inner tub of the washer spins, water is forced out through holes in the tub and drained.

Commercial washers allow the user to select a cycle that best suits the wash load. The amount of soil, the kind of fabric, the construction of the items, the color of the fabric, and the equipment used should be considered when choosing a wash cycle. A standard cycle is a permanent-press cycle. At the end of the permanent-press cycle, there is a cool-down period in which cooler water is used to cool garments and minimize wrinkles that might be set in during extraction. Many washers have soak or prewash settings to meet special needs. The cycles of washing machines differ, but all washers control the following conditions:

- fill
- wash and rinse temperature ranges
- wash time
- total cycle time
- agitation speed
- spin speed

Some laundries may divide the wash process into two parts with two separate machines. Laundry may be washed in a washer and then loaded into a cart and taken to an extraction machine. An ***extraction machine*** is a machine that spins or squeezes water from laundry. The preferred method is to use a washer/extractor machine. A ***washer/extractor machine*** is similar to a home washing machine in that the machine both washes and extracts water from laundry. Washer/extractor machines reduce the amount of laundry handling and physical lifting. In addition, the cycle time is shortened, and the potential for accidents is decreased because the floor does not become wet.

Sophisticated laundry equipment is used in some laundries. Some commercial washers are controlled by a computer that can be programmed to maintain the correct water temperature and to dispense the correct amounts and types of laundry products during the appropriate stage of the washing process. Hoses hook directly to dispensers of liquid laundry products, and products are automatically added to the washer in the correct amounts. Computerized washers allow the user to push buttons that describe the type of wash desired. Some commercial washers have programmed cards that the operator inserts into a special location on the washer. These programmed cards contain information on the types and amounts of laundry products to be dispensed, the length of cycles, and the water temperature.

When using a commercial washer, the following guidelines promote effective results:

- Follow the manufacturer's instructions.
- Load the washer properly.
- Set the washing controls according to the size and type of the load.
- Select the correct water temperature. Provide an adequate supply of hot water, if needed.
- Use a suitable detergent or soap. Measure according to the amount of water. Too much detergent produces too many suds, and laundry is not rinsed clean. Too little detergent does not provide adequate cleaning power.

- Clean the inside and outside of the washer after each use.
- Clean the lint filter after each use. A lint filter is a device found in washers and dryers that collects lint as water or air passes through it.
- Leave the lid open until the tub is dry.
- Wipe up laundry product spills inside and outside the washer.
- Do not launder rags or cloths used with flammable liquids such as gasoline, paint thinners, and cleaning solvents.

Commercial Dryers. *Drying* is a process of evaporation that occurs naturally. Drying occurs faster when the temperature of the air is increased. For example, laundry on an outdoor clothes line will dry faster on a warm, dry day than on a cold, damp day. Drying also occurs faster when the rate of airflow across the wet surface is increased. For example, laundry on an outdoor clothes line dries faster on a breezy day than on a calm day. A ***commercial dryer*** is a mechanical device that controls temperature and rate of airflow. Commercial dryers save time and energy, make articles soft and fluffy, help

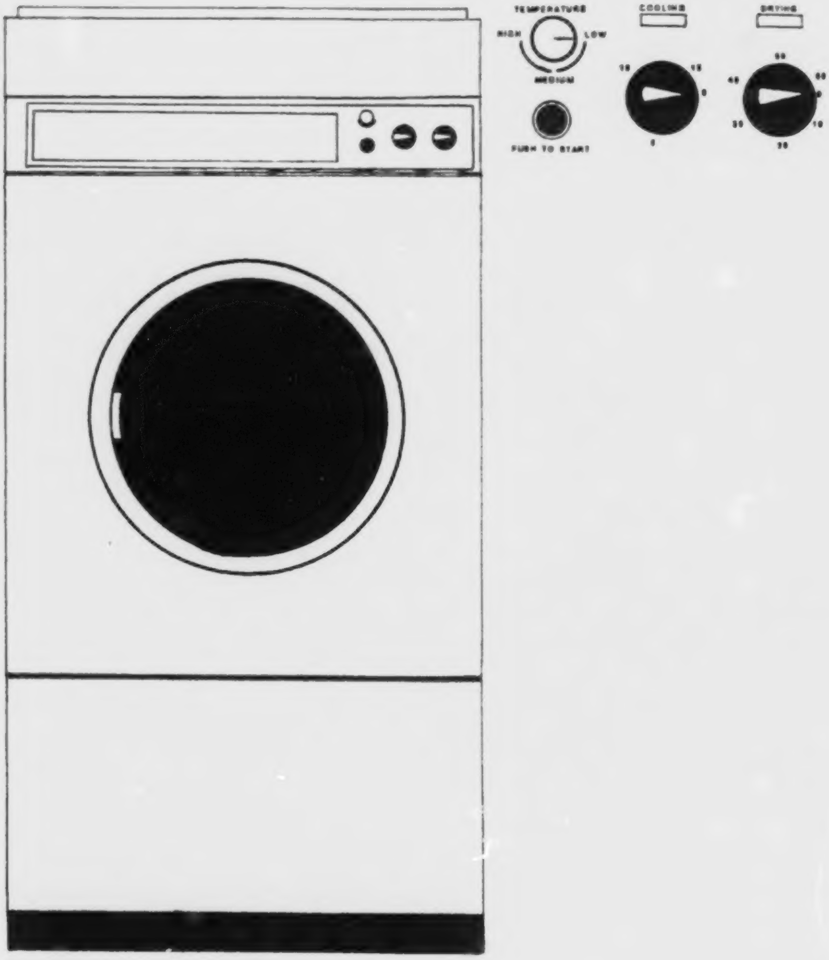


Figure 21.2

remove wrinkles, and prevent fading associated with sunlight. The main disadvantage of commercial dryers is that improper drying can increase shrinkage, damage some fabrics, and cause wrinkles (when the dryer is overloaded). An example of a commercial dryer is shown in figure 21.2.

A commercial dryer operates by taking in air from outside of the dryer and heating it. Heat for drying is produced by a gas flame, steam, or an electric element. A thermostat controls the temperature of the heated air. A ***thermostat*** is a device that regulates temperature to a certain level. The level may be fixed by the manufacturer of the dryer or set by the user. Heated air goes into a revolving cylinder or drum that is turned by a motor. Like the front loader washing machine, the dryer drum has baffles to help move wet laundry around as it dries. As the drum tumbles, the dryer motor turns a fan that circulates heated air over and through wet laundry. As the heated air circulates, it absorbs moisture. The moistened air is exhausted out of the dryer to the outdoors, and more hot, dry air enters the dryer drum. This process continues throughout the drying cycle. When there is no longer a significant amount of moisture being evaporated from the laundry in the dryer drum, the temperature of the air rises to the level permitted by the thermostat of the dryer, and the temperature of the laundry approaches the temperature of the surrounding air.

The length of time required to dry laundry depends upon the following factors:

- the temperature at which the dryer is set and the air circulation in the dryer. The amount of time required for drying shortens as the drying temperature is increased.
- the size of the load - As the size of the load increases, drying time increases.
- the amount of moisture in the laundry - When most of the water is extracted from laundry during the washing process, the drying time will be shortened.
- the type of fabric - Lightweight fabrics dry more quickly than heavy fabrics.

Different methods are used to time the drying process. The length of time a dryer will operate can be determined by setting a timer, monitoring the load, or allowing electronic moisture sensors to monitor the load. A ***timer*** is a control dial marked in minutes. When the timer is set for an excessive length of time, overdrying can occur. Overdrying causes some fabrics to shrink, wrinkle, or discolor. Stiffness of cotton fabrics also occurs. Since laundry varies in type of fabric, size, and amount of moisture retained from the wash, proper drying time is difficult to judge. To obtain satisfactory results when using a timer controlled dryer, the operator must have the ability to correctly judge the length of time it will take a load to dry.

An individual can estimate when a load is dry by monitoring the length of time it takes for the heat source of the dryer to cycle on. The heat source in a dryer cycles on and off to maintain a predetermined air temperature inside the dryer drum. The heat source turns on when the temperature in the dryer drum drops. As laundry becomes dry, it takes longer for the temperature inside the dryer drum to drop and cause the heat to come back on. Therefore, the dryer operator knows the load is properly dried when the heat source remains off for a certain amount of time. This method of timing the drying of laundry is an indirect measurement of the dryness of the load. Therefore, it is more accurate than time controlled drying.

Some commercial dryers contain built-in sensors in the dryer drum or door to monitor the level of moisture in laundry. When wet laundry tumbling in the dryer comes in contact with the sensors, the moisture in the laundry completes an electric circuit. When there is not enough moisture in the laundry to complete the circuit, the dryer tumbles the laundry for a cool-down period and then stops. Dryers equipped with moisture sensors are effective since they are less likely to overdry or underdry laundry.

When using a commercial dryer, the following guidelines promote effective results:

- Do not overload a dryer. Overloading makes the machine work harder, results in longer drying time, and causes wrinkles.
- Dry items of similar weight and construction together to avoid overdrying or underdrying.
- Clean the lint filter after each use of the dryer. A clean lint filter ensures proper air circulation throughout the dryer and prevents the possibility of a fire.
- Do not machine dry plastic, fiberglass, or foam rubber items, such as foam rubber pillows, plastic aprons, shower curtains, and sheer curtains made of fiberglass. Drying these items may present a fire hazard. Glass fibers from fiberglass items can break and remain in the dryer where they can become attached to other fabrics and cause skin irritations. These items may be placed in the dryer and dried using air only and no heat. However, tumbling may damage plastic and metallic fabrics.
- Never machine dry items containing flammable liquids, solids, or cleaning solvents. In addition, never use solvents such as gasoline, kerosene, furniture polish, or other flammable liquids in a dryer. Fire and explosion can occur. Never use or store flammable liquids near a dryer.
- Clean air intakes and exhaust ducts periodically to ensure optimum operation. Improper venting tends to increase drying time. Longer drying time results in the use of more energy and higher operating costs.
- Never allow children to play near or operate a dryer. Serious injury can occur if a child crawls inside of a dryer and the dryer is turned on.
- Never use the dryer door opening as a step stool.
- Read and follow manufacturers' instructions on laundry products used in the dryer.

To make efficient use of drying time, individuals should carefully sort laundry before placing it in the dryer. For example, items that require pressing can be placed in a load together so the load can be removed and pressed while slightly damp. Other loads can consist of items that do not require pressing or items that can be pressed without dampening. Starched laundry should also be sorted and dried separately from unstarched laundry.

◆ Essential Questions: ◆
Commercial Laundering

1. What characteristics should be considered when cleaning textile and apparel products?
2. What general guidelines should be followed when using laundry products?
3. What are the functions of the following laundry products: presoak products, soaps, detergents, bleaches, fabric softeners, and starches?
4. What general guidelines should be followed when sorting laundry?
5. What three basic methods are used to treat stains? Briefly describe each method.
6. What three forms of energy are required to remove soil from fabric? How is each form of energy supplied during laundering?
7. What are the main differences between commercial laundry equipment and home laundry equipment?
8. What washing conditions are controlled during a wash cycle?
9. What factors affect the length of time required to dry laundry?
10. What are five guidelines for using a commercial dryer effectively?

COMMERCIAL DRY CLEANING

Like commercial laundries, commercial dry cleaners also provide customers with clean textile and apparel products. However, dry cleaners use chemicals rather than water to clean items. A full-service dry cleaner offers complete cleaning services including pretreating and pressing. Some dry cleaners offer bulk cleaning services in addition to full-service dry cleaning. ***Bulk cleaning*** involves placing items in washer/extractors, allowing a full cleaning cycle to run, and drying the items. Items that are bulk cleaned are not pretreated, checked for stains after cleaning, steamed, or pressed. Sweaters and other items that are not heavily soiled or do not need to be pressed are usually bulk cleaned. The charge for bulk cleaning services is often based on the weight of the items to be cleaned.

Before textile and apparel products are dry-cleaned, they must first be prepared for cleaning. If items are not adequately prepared for dry cleaning, they can be damaged or destroyed during the cleaning process. To avoid damaging customers' belongings, dry cleaning employees should be thoroughly trained and follow proper procedures throughout the dry cleaning process.

Precleaning Procedures

Before actually dry cleaning textile and apparel products, employees test them for colorfastness and durability. Some fabrics should not be dry-cleaned or they should be cleaned using a special process. For example, leathers and furs must be specially treated. They should never be cleaned with garments constructed from other fabrics. Some fabrics made of manufactured fibers should not be dry-cleaned because they are not able to withstand the dry cleaning solvents. A ***solvent*** is a specific type of chemical cleaning agent. Solvents mix with staining materials, dissolve them, and then form a removable liquid or powder that is washed away.

In order to test the durability and colorfastness of items, dry cleaners expose an inconspicuous area of the fabric, such as an inner seam allowance, to a small amount of dry cleaning solvent. If the color does not bleed and the fabric remains intact, the item can be dry-cleaned safely.

Pretreating is an important step in the dry cleaning process. Dry cleaners can usually remove stains if the soiling material is identified. It is important to identify the soiling material because there are two types of stain removal chemicals. ***Wet side chemicals*** are used to remove stains that contain water. ***Dry side chemicals*** are used to remove stains that do not contain water. For example, wet side chemicals are frequently used to remove beverage stains while dry side chemicals are generally used to remove make-up, oil, and grease stains.

When wet side chemicals are used to remove stains, the stains are moistened, flushed, and then aired. The treated item cannot be cleaned until the moistened area is completely dry. When dry side chemicals are used to remove stains, tamping may be done. When removing any type of stain, employees should work with the smallest stain area possible. Cleaning chemicals should not be brushed onto or allowed to spread to unsoiled areas of the item.

Cleaning Procedures

After items are pretreated, they are placed in a washer/extractor machine where they are dry-cleaned. The washer/extractor machines resemble washer/extractor machines used for laundering. Although the cleaning process is referred to as dry cleaning, the solvents used are not actually dry. The cleaning solvents used are wet. The process is called dry cleaning because water is not used and the solvents that are used dry quickly.

Although the commercial dry cleaning process is safe for most textile and apparel products, some items are too delicate to withstand even mild mechanical cleaning action. Delicate items, such as antique lace and hand-stitched samplers, often have a great deal of sentimental value, and care should be taken to clean the items in a safe manner.

Delicate items are often placed in leak-proof containers that contain small amounts of dry cleaning solvent. The items are left to soak and are not moved in any way. The items are monitored carefully and are removed from the cleaning solution when they are thoroughly cleaned. Some dry cleaners allow the items to air-dry while others dry them in dryers. Before cleaning any item in this manner, employees should make sure the work area is well ventilated.

Dry Cleaning Equipment

Washer/extractor machines operate much like front loading washing machines. Inside the washer/extractor there is a large metal basket that tumbles the items. The cleaning solvent constantly passes through filtering systems that remove soil and catch foreign materials.

Most of the filtering system is located outside of the machine, often in the back. As the dry cleaning solvent is filtered, it first passes through button traps. ***Button traps*** catch buttons, items left in pockets, and other items that may come off of apparel and textile products. After the solvent passes through the button traps, it passes through filters that remove coloration. When dyes bleed, these filters prevent the bleeding dye from damaging other items.

The filters operate like an automobile oil filter. There are rods in the centers of the filters that continuously push the solvent through while removing and containing dirt, oil, and odors. The filters pump the purified solvent back into the washer/extractor and the entire process is repeated. Because of the continuous filtering action, items are always being cleaned with fresh solvent.

The filtering systems may pump the solvent back into the washer/extractors at a rate of one gallon per minute. In one minute, sixty gallons of dry cleaning solvent are cleaned, deodorized, and pumped back into the machine to begin the cleaning process again. The filters are changed periodically to ensure that the cleaning solvents are always filtered properly.

The washer/extractors are able to remove almost all stains that remain intact after pretreating. However, some stains demand further attention. Spotters are responsible for removing any stains that remain. ***Spotters*** are dry cleaning employees who use a variety of chemicals, brushes, and steam guns to remove stubborn stains.

After the cleaned textile and apparel products are extracted, they are dried unless customers have requested an additional process such as flameproofing or mothproofing. Commercial dry cleaning dryers resemble dryers used in commercial laundries. They are front loading, but they do not reach the same high temperatures. Dry cleaning dryers generally do not reach temperatures above 120°F.

Postcleaning Procedures

After items are dried, they often appear ready to wear. Before items are ready to be returned to customers, however, they must be finished. The finishing stage of dry cleaning involves pressing textile and apparel products or hanging them in steam cabinets. The steam in the steam cabinets loosens the garment fibers and usually results in items assuming their original shapes.

Commercial dry cleaners also offer blocking services. ***Blocking*** is the process of shaping or molding a garment to return it to its original shape. Sweaters often lose their shape over time, but blocking can return the sweaters to their original shapes. Items that have been blocked often appear new.

◆ Essential Questions: ◆
Commercial Dry Cleaning

1. What services are provided in bulk cleaning? What products are likely to be bulk cleaned?
2. What tests should be performed before actually cleaning a product? Why?
3. What is the difference between the functions of wet side chemicals and dry side chemicals?
4. Since solvents used in the dry cleaning process are wet, why is the process called *dry cleaning*?
5. What purposes do the filters on washer/extractor machines serve?
6. What are examples of postcleaning procedures performed after textile and apparel products are dried?

Chapter Highlights

☆ Laundry employees should be thoroughly trained in the correct use of laundry products such as presoak products, soaps, detergents, bleaches, fabric softeners, and starches.

☆ Items to be laundered should be sorted into a minimum number of categories according to characteristics such as the following: color, soil, size, texture, and type of handling required following the laundry process.

☆ Methods used to treat stains include soaking in a presoak product, pretreating with a stain remover, and removing using a stain removal guide and stain removal kit.

☆ The following types of energy are necessary to remove soil from fabric:
  - mechanical (agitation or rotation of washer tub)
  - chemical (laundry products)
  - thermal (hot, warm, or cold water)

☆ Commercial washers may include features such as the following: large load capacity, loading from the front, variety of cycles, extraction cycle, computerized control, and automatic dispensing of laundry products.

☆ Commercial dryers control temperature and rate of airflow during the drying process. This saves time and energy, makes articles soft and fluffy, helps remove wrinkles, and prevents fading of garments (such as caused by sunlight).

☆ The length of time required to dry laundry depends on the temperature of the air circulating in the dryer, the size of the load, the amount of moisture in the laundry, and the type of fabric.

☆ Commercial dry cleaners usually offer full service dry cleaning and bulk cleaning.

☆ Before textile and apparel products are dry-cleaned, they should be pretreated and tested for colorfastness and durability.

☆ Textile and apparel products are dry-cleaned in washer/extractor machines that constantly filter the dry cleaning solvent to remove bleeding dye, dirt, oil, and odors.

Chapter 22

Receiving, Marking, and Identifying Laundry and Dry Cleaning

Chapter Focus

The following Essential Knowledge and Skills are discussed in this chapter:

7A Define terms commonly used in commercial textile and apparel care.

7G Determine procedures for efficiently marking and tracking items in a commercial textile and apparel care operation.

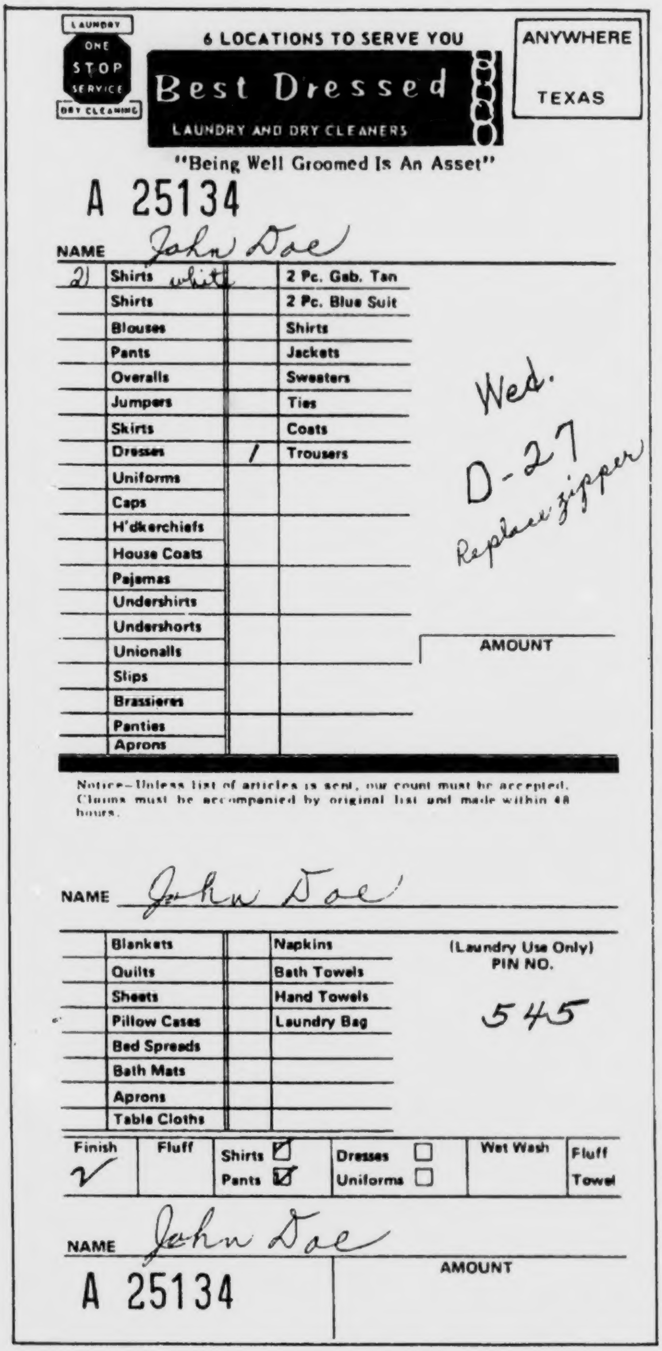
Chapter Vocabulary

commercial laundry
dry cleaning plant
finish
indelible ink
laundry drop-off center
ornamentation
pressing
pretreating
self-service dry cleaning machine
sizing
soiling materials

Employees of laundries and dry cleaners are responsible for caring for customers' textile and apparel products. Employees should be trained to follow certain procedures for receiving, marking, and identifying laundry and dry cleaning in order to reduce the risk of damaging or misplacing items. When proper procedures are followed, customers are satisfied with the results, and dry cleaners or laundries receive repeat business that results in increased profits. It is important to remember that procedures for receiving, marking, and identifying laundry and dry cleaning differ among businesses. Therefore, employees should learn and follow the procedures of the place of employment.

RECEIVING, MARKING, AND IDENTIFYING LAUNDRY

Many individuals choose to have textile and apparel products cleaned by a commercial laundry. A ***commercial laundry*** is a place of business where textile and apparel products are laundered for a fee. Customers may take items directly to the laundry or to a laundry drop-off center. A ***laundry drop-off center*** is a location where customers drop off and pick up laundry. No actual laundering is performed at a laundry drop-off center. Items are taken to another location to be laundered. When receiving items, employees should ask customers to point out any spots or stains on items and describe what caused the stains. This information is usually recorded on a ticket such as the one shown in figure 22.1.



LAUNDRY ONE STOP SERVICE DRY CLEANING

6 LOCATIONS TO SERVE YOU

Best Dressed

LAUNDRY AND DRY CLEANERS

ANYWHERE

TEXAS

"Being Well Groomed Is An Asset"

A 25134

NAME John Doe

2)	Shirts white		2 Pc. Gab. Tan
	Shirts		2 Pc. Blue Suit
	Blouses		Shirts
	Pants		Jackets
	Overalls		Sweaters
	Jumpers		Ties
	Skirts		Coats
	Dresses	/	Trousers
	Uniforms		
	Caps		
	H'dkerchiefs		
	House Coats		
	Pajamas		
	Undershirts		
	Undershorts		
	Unionalls		
	Slips		
	Brassieres		
	Panties		
	Aprons		

Wed.

D-27

Replace zipper

AMOUNT

Notice—Unless list of articles is sent, our count must be accepted. Claims must be accompanied by original list and made within 48 hours.

NAME John Doe

	Blankets		Napkins
	Quilts		Bath Towels
	Sheets		Hand Towels
	Pillow Cases		Laundry Bag
	Bed Spreads		
	Bath Mats		
	Aprons		
	Table Cloths		

(Laundry Use Only)
PIN NO.
545

Finish	Fluff			Wet Wash	Fluff Towel
✓		Shirts ☑ Pants ☑	Dresses ☐ Uniforms ☐		

NAME John Doe

A 25134

AMOUNT

Figure 22.1

Explaining Costs

Before a customer leaves a laundry or laundry drop-off center, an employee may explain the pricing systems. Some commercial laundries charge by weight and others charge per item. For example, one laundry may weigh a basket of items and charge one price for laundering the entire basket. Another laundry may only launder specific items such as shirts, slacks, and sweaters. Commercial laundries that only launder certain items are more likely to charge a specific price for each item that is laundered rather than one price for an entire load.

In commercial laundries where the fee is based on weight, items are often laundered using methods similar to methods used to wash items in the home. Items are sorted, washed, dried, and folded or hung. Special services such as the following usually are not included in the laundering price:

- ***pretreating*** - using stain removal products to remove stains from items before they are laundered
- ***sizing*** - applying a liquid to a garment to achieve a smooth, matte finish
- ***pressing*** - using a heated instrument to remove wrinkles from fabrics without using any gliding action

Special treatments such as those described may be available, but usually customers must pay an additional fee to have them provided.

In laundries where a specific price is charged for each item laundered, an additional fee is usually not charged for special treatments. Since an additional fee for special treatments is not charged, however, the price for laundering may be higher.

Labeling and Sorting

The textile and apparel products a customer leaves at a laundry or laundry drop-off center usually are labeled or identified in at least two ways to ensure that they are returned to the correct owner after laundering. In some laundries, the customer's name is written in indelible ink on an inconspicuous place on each item, such as an inside seam. ***Indelible ink*** is permanent and cannot be removed during the cleaning process. Some laundries tag items with a number that corresponds to the number on the receipt given to the customer when items are dropped off.

When customers drop off items to be laundered they often identify soiling materials that have caused stains. ***Soiling materials*** are liquids and solids that attach to the fibers of a fabric and produce a stain. Laundry employees who receive soiled items should tag the soiled areas immediately. The tags should identify the soiling materials and their locations on the items. When stains are tagged, items can be treated properly when laundered. Some laundries tag stained items with color-coded tags that correspond to various types of common soiling materials such as grease, oil, and protein.

After items are labeled, they are usually sorted. Items that are laundered at another location, however, may not be sorted at a laundry drop-off center. At a laundry drop-off center, unsorted items are placed in a deposit cart and taken to another location for sorting and laundering. When items are laundered where the customer drops them off, employees sort them according to characteristics such as color, texture, weight of fabric, and type of soil. Textile and apparel products must be sorted properly in order to avoid damage during laundering. Once items are accurately identified and sorted correctly, they are ready for laundering.

◆ Essential Questions: ◆ Receiving, Marking, and Identifying Laundry

1. Why should employees ask customers to identify and point out the locations of stains on items to be laundered?

2. Why do commercial laundries and dry cleaners often operate several drop-off centers but only one cleaning operation?

3. How do laundry services provided by laundries that charge by weight usually differ from laundry services provided by laundries that charge per item?

4. Why do employees usually label or otherwise identify a customer's items in more than one way? What are two ways items may be labeled or identified?

RECEIVING, MARKING, AND IDENTIFYING DRY CLEANING

When customers drop off textile and apparel products at commercial dry cleaning establishments, the procedures followed are similar to those followed when items are dropped off at laundries. Employees ask customers questions similar to those asked at laundries and complete tickets such as the one shown in figure 22.1. Employees ask what type of dry cleaning services are desired and then explain the costs for the services. Customers should also be asked to identify any soiling materials that may have stained their textile and apparel products. When customers identify soiling materials, employees should properly tag items.

Types of Dry Cleaning Services

Customers often do not realize that there are a variety of dry cleaning services available. Dry cleaning employees who receive textile and apparel products must understand each type of dry cleaning service offered and be able to properly explain the services to customers. Once customers understand the types of services offered, they can make informed decisions about how they wish to have their belongings dry cleaned. Once a dry cleaning service is chosen, employees should tag each item appropriately.

Before customers leave dry cleaning establishments, employees should ask if they would like any additional finishing services. Dry cleaners often replace sizing and other fabric finishes. A ***finish*** is a treatment or process used to improve different fabric characteristics. Employees should also ask customers if they would like any minor damage to textile and apparel products repaired. Dry cleaners often mend torn seams, repair broken zippers, and replace missing buttons. However, there may be an additional charge for these services.

After determining how customers wish to have their items dry cleaned, employees should explain when the items will be ready for pickup. In addition, the customer should be politely thanked for choosing the dry cleaning establishment.

Sorting and Separating Dry Cleaning

When textile and apparel products are dry-cleaned at a drop-off center, employees sort the items according to the type of fabric, color of fabric, and degree of soiling. If items are dry-cleaned at a dry cleaning plant, sorting is done when the items are delivered to the plant. A dry cleaning plant is a central location where dry cleaning processes are performed.

When sorting items, employees should fasten buttons, close zippers, empty pockets, and remove any ornamentation. ***Ornamentation*** is a decorative item, such as a feather or pin, that is used to accessorize textile and apparel products. Items found in the pockets of clothing and ornamentation that is removed should be placed in an envelope labeled with the customer's name. The envelope should be returned to the customer when items are picked up.

Ornamentation is usually delicate and cannot withstand dry cleaning solvents or mechanical cleaning action. Therefore, it is important to remove ornamentation before dry cleaning. Ornamentation should also be removed so that it is not lost. Since the items belonging to several customers are dry-cleaned together, it can be difficult to correctly match items with ornamentation that is unattached.

Some businesses offer both commercial laundry and dry cleaning services. Individuals employed by this type of business must be attentive when customers explain the type of cleaning services they desire. Customers routinely request that some items be laundered and others be dry-cleaned. Sometimes customers are unsure about which cleaning service will meet their needs. Customers usually follow the advice they are given when they drop off their textile and apparel products. Therefore, employees must be able to give advice based upon a thorough understanding of the cleaning options available.

Self-Service Dry Cleaning

Sometimes dry cleaners provide self-service dry cleaning machines for use by customers. A ***self-service dry cleaning machine*** is similar to a coin-operated washing machine in a laundromat. Textile and apparel products are placed in the dry cleaning machine and tumbled in nonflammable dry cleaning solvent. Customers may need the assistance of a dry cleaning attendant in purchasing cleaning fluids and operating the machine. Employees should learn how to operate self-service dry cleaning machines and be able to explain their use quickly and thoroughly. The cost of self-service dry cleaning is less than professional dry cleaning. However, services such as spotting, mending, and pressing are not available.

◆ Essential Questions: ◆
Receiving, Marking, and Identifying Dry Cleaning

1. Why is it important for an employee to explain to the customer the types of dry cleaning services available?
2. What additional finishing services may be offered by dry cleaners?
3. What are examples of minor repairs that dry cleaners may offer to make?
4. Why should ornamentation be removed before items are cleaned?
5. How does self-service dry cleaning differ from professional dry cleaning?

Chapter Highlights

- Employees should ask customers to point out stains on textile and apparel products and identify soiling materials.
- Some laundries charge a fee to launder an entire basket of items while others charge a set fee per item.
- Laundry fees based on the weight of a basket of textile and apparel products usually do not include fees for special services such as prespotting, sizing, and pressing.
- All items that are left to be cleaned are usually labeled and identified in at least two ways to ensure that they are returned to the owner after cleaning.
- When textile and apparel products are cleaned at a laundry drop-off center, they are sorted according to characteristics such as color, texture, weight of fabric, and type of soil before being laundered.
- Dry cleaning employees should ask customers if they desire additional services such as the replacement of sizing or other fabric finishes.
- Dry cleaners often mend torn seams, repair broken zippers, and replace missing buttons. However, there may be an additional charge for these services.
- Ornamentation should be removed from textile and apparel products before cleaning. Ornamentation is delicate and usually cannot withstand cleaning solvents or mechanical cleaning action.

Chapter 23

Safety and Sanitation for Laundering, Pressing, and Dry Cleaning

Chapter Focus

The following Essential Knowledge and Skills are discussed in this chapter:

7A Define terms commonly used in commercial textile and apparel care.

7B Explain how regulations pertaining to workplace safety, labor, and environmental issues affect the commercial textile and apparel care operation.

7C Apply effective safety and sanitation practices in textile and apparel care operations.

7D Identify equipment and supplies and their uses in textile and apparel care.

7E Demonstrate proper selection, use, and care of equipment and products for cleaning, laundry, and pressing tasks.

7H Complete commercial textile and apparel care tasks according to industry standards.

Chapter Vocabulary

friction door latch
heel
interlocking device
lid switch
limiter controller
motor protector
push-to-stop timer
safety brake
safety door switch
safety features
sanitation
separate start button
stagnant solvent

Many times, employees ignore preventive measures and safety programs. As a result, accidents occur. Most accidents are caused by carelessness and are avoidable. Accidents happen when individuals are irresponsible or do not care about their work. Laundry and dry cleaning employees are responsible not only for their own safety but also for the safety of others in the workplace. Benefits of reducing accidents include lower insurance premiums, maximized productivity, and a lower absentee rate resulting in higher morale among co-workers.

THINK

OUR AIM, NO ACCIDENTS

SAFETY PROCEDURES

Irresponsible behavior leads to many accidents. Irresponsible behavior includes attempting tasks without having proper training, removing safety devices from equipment, operating machinery at unsafe speeds, using defective equipment, using equipment improperly, and failing to use safety devices. Employees can prevent accidents by following proper procedures and acting maturely when using equipment and supplies.

Unsafe physical conditions also contribute to the accident rates in commercial laundries and dry cleaners. Unsafe physical conditions include inadequate guards on machinery, defective equipment, hazardous processes or procedures, inadequate lighting, inadequate ventilation, and improper dress. By correcting these factors, individuals can prevent accidents. Additional information regarding safety and sanitation is included in Chapter Four.

Laundry

Most commercial washers have safety features. ***Safety features*** are special parts included on a piece of equipment to protect the operator from harm. It is important that laundry employees learn about the safety features of commercial washing machines in order to avoid injury. Safety features include the following:

- ***lid switch*** - keeps the inner tub from spinning or agitating when the lid is open
- ***safety brake*** - keeps the inner tub from spinning or agitating when the lid is open
- ***push-to-stop timer*** - allows the operator to stop a cycle in progress
- ***interlocking device*** - prevents the lid of the washer from being opened while the tub is in motion

It is important that an individual never place his or her hand or arm in a moving washer. A moving washer can pull in a hand or arm and cause severe injury and disfigurement.

Like commercial washers, commercial dryers also have safety features to protect the operator. It is important for laundry employees to learn about the safety features of dryers in order to avoid injury. Safety features include the following:

- ***safety door switch*** - keeps the dryer from heating or tumbling when the door is open
- ***separate start button*** - will not allow the dryer to turn on until the controls are set, the door is closed, and the start control is pushed or turned
- ***friction door latch*** - allows the dryer door to be opened from the inside; prevents small children from being trapped inside
- ***limiter control*** or ***motor protector*** - guards against overheating; heat source turns off if drum stops tumbling

The safety features on commercial laundry equipment are effective in preventing accidents. However, safety features only prevent accidents when employees follow established safety rules. Employers should explain safety policies and practices thoroughly to all employees. In addition, periodic meetings can be held to review safety features and information.

Dry Cleaning

Even though safe dry cleaning solvents have been developed, employees can suffer injuries if they do not use solvents properly. If a dry cleaning solvent is spilled on the skin, it should be washed off immediately. If solvent is spilled on clothing that is being worn, the clothing should be removed immediately and aired out until the solvent has completely evaporated.

When using dry cleaning products and equipment, employees should observe the following safety guidelines:

- Check dry cleaning equipment for proper operation. If equipment is not operating properly, notify a supervisor immediately.
- Handle dry cleaning solvents carefully. Do not spill them on anything.
- Maintain adequate ventilation in the work area.
- Do not put dry cleaning solvents into a washing machine.
- Do not put garments damp with dry cleaning solvent into a commercial dryer.

Dry cleaning solvents should be stored in safe areas away from sparks and flames. Even sparks from fans can be dangerous. Nonflammable solvents do not ignite when they come into contact with sparks or flames, but they can break down and produce poisonous vapors.

Pressing

Commercial pressing equipment can become very hot and cause serious burns if it comes into contact with skin. Equipment that uses steam to press garments can also cause burns if used incorrectly. The steam produced is extremely hot and can burn skin just as easily as hot irons. Whenever using any type of pressing equipment, employees should not touch the pressing surfaces.

Commercial pressing equipment is often bulky or heavy. Employees should not attempt to move any pieces of pressing equipment. Since the equipment is often located in the safest possible area, moving it could create hazardous conditions. Some pieces of pressing equipment are foot operated. To avoid foot injuries when operating this type of equipment, employees should wear sturdy shoes.

Employees should also be cautious when using conventional irons such as those used in the home. When an iron is not in use, it should be placed on the heel in an upright position. The ***heel*** is the part of the iron that acts as a rest and holds the iron in a well-balanced, upright position. When irons are not in use, they should always be turned off and unplugged. Employees should practice turning off irons and unplugging them whenever pressing is completed. In order to prevent shocks, employees should empty any remaining water from steam irons after use.

Iron manufacturers have designed controls that supply only the amount of heat an iron needs. The controls prevent irons from reaching excessively high temperatures and becoming fire hazards. Manufacturers have also designed irons so that the heating elements are insulated from the metal bodies. This reduces the risk of electrical shock. In addition, well-designed irons are insulated so that heat is concentrated at the pressing surfaces and the upper surfaces remain cool.

◆ Essential Questions: ◆ Safety Procedures

1. What are the benefits of reducing accidents in commercial laundries and dry cleaners?
2. What are examples of unsafe physical conditions that may contribute to accident rates in commercial laundries and dry cleaners?
3. What safety features are found on commercial washing machines? How does each of these features protect the operator?
4. What safety features are found on commercial dryers? What is the function of each safety feature?
5. What safety guidelines should be followed when using dry cleaning products and equipment?
6. What safety practices should be followed when using commercial pressing equipment?

SANITATION PROCEDURES

Sanitation is the process of making something clean or sterile. Clean or sterile conditions promote hygiene and prevent disease. Sanitation is an important aspect of laundering and dry cleaning. Laundry and dry cleaning employees should have a knowledge and understanding of sanitation and disinfection principles in order to efficiently kill germs and prevent the contamination of textile and apparel products. In addition, employees should also practice good personal hygiene. Keeping oneself clean reduces the risk of spreading germs. Maintaining high standards of cleanliness in commercial laundries and dry cleaners also prevents liability claims and loss of future business.

Local, state, and federal health departments employ inspectors who monitor the cleanliness of business establishments. The inspectors are also responsible for making sure commercial laundries and dry cleaners satisfy sanitation regulations. Inspectors often visit laundry and dry cleaning establishments unannounced. Employees should avoid interfering with the work of an inspector. Also, any suggestions for improvement made by an inspector must be followed.

Laundry

Textile and apparel products can be sanitized by washing in hot water. The wash water temperature should be at least 130°F. If wash water is not hot enough, some germs may not be destroyed, and laundry will not be sanitized.

Textile and apparel products can also be sanitized in the dryer. Some commercial dryers are equipped with ultraviolet lamps. These lamps produce light rays that sanitize the laundry as it tumbles in the dryer.

Commercial washing machines must be sanitized on a regular basis to control the spread of germs from one load of laundry to another. If a washing machine harbors germs, textile and apparel products will not be sanitized no matter how hot the wash water is. Liquid bleach and warm water can be used to sanitize commercial washers. Bleach should be poured into the washer and the washer should be set to run on a sanitize or warm rinse cycle. When the sanitation cycle ends, the washer is sanitized and ready to use for laundering.

Dry Cleaning

Commercial dry cleaners do not use hot water to sanitize the items they clean. The cleaning solvents used in dry cleaning machines sanitize items during the dry cleaning process. The dry cleaning solvents are continuously pumped through a series of tanks and filters that catch debris, pump away germs, and keep the solvents sanitized. Textile and apparel products are never exposed to stagnant solvent. ***Stagnant solvent*** is solvent that is allowed to collect in a pool. Since stagnant solvent is not continuously filtered, germs are allowed to accumulate.

The quality of air in any dry cleaning establishment must be monitored closely. Dry cleaning solvents have distinct odors and should not contaminate the air. If odors are present, solvents may be leaking from dry cleaning machines, or they may not be stored properly. Air in a dry cleaning establishment should constantly be recirculated with fans to ensure that it is not contaminated by solvents. If the smell of cleaning solvent is noticeable, a supervisor should be notified immediately.

Pressing

If items have not been properly sanitized during the laundering or dry cleaning process, they must be cleaned again before being pressed. Pressing does not sanitize textile and apparel products. Therefore, items must be sanitized before they reach the pressing stage of the commercial laundering or dry cleaning process.

An important aspect of pressing sanitation is keeping pressing equipment clean and free of germs. Equipment that looks clean may still be contaminated with germs that are invisible to the naked eye. Dirty or soiled textile and apparel products should not be pressed since germs can easily be transferred to pressing equipment. The pressing stage is the final stage of the commercial laundering and dry cleaning process. If pressing equipment is not clean and sanitized, germs can be transferred to textile and apparel products and the laundering or dry cleaning process will have to be repeated.

Hot steam and industrial disinfectants can be used to sanitize commercial pressing equipment. The surfaces of pressing equipment should be cleaned with a disinfectant regularly. Press cloths and stuffed or molded pressing aids should also be cleaned regularly to control the spread of germs.

◆ Essential Questions: ◆ Sanitation Procedures

1. Why is sanitation an important aspect of laundering and dry cleaning?
2. How can textile and apparel products be sanitized during the laundry process?
3. How are textile and apparel products sanitized during dry cleaning?
4. Why is it important to sanitize washers and pressing equipment regularly?
5. How can commercial pressing equipment be sanitized?

Chapter Highlights

- Most accidents are caused by carelessness and are avoidable.
- Benefits of reducing accidents include personal health and safety, lower insurance premiums, maximized productivity, and a lower absentee rate resulting in a higher morale among co-workers.
- Commercial washers and dryers include safety features that protect the operator from harm. Safety features found on commercial washers include the lid switch, safety brake, push-to-stop timer, and interlocking device. Safety features found on commercial dryers include the safety door switch, separate start button, friction door latch, and limiter control or motor protector.
- Dry cleaning employees should check equipment for proper operation, use caution and avoid spilling solvents, maintain adequate ventilation, and use solvents properly.
- To prevent accidents when using commercial pressing equipment, employees should avoid touching pressing surfaces, avoid moving equipment, turn off and unplug equipment when not in use, and empty water from steam irons after use.
- Textile and apparel products can be sanitized during laundering by washing in hot water (at least 130° F) or drying in a dryer equipped with ultraviolet lamps.
- The cleaning solvents used in dry cleaning machines sanitize items during the dry cleaning process.
- The quality of air in dry cleaning establishments must be constantly recirculated and monitored closely. Dry cleaning solvents have distinct odors and should not contaminate the air.
- To control the spread of germs during pressing, equipment should be sanitized regularly. Dirty textile and apparel items should not be pressed since germs can be easily transferred to pressing equipment.

REFERENCES

American Textile Manufacturers Institute. (1997). *America's Textiles.* Washington, DC.

Davis, M.L. (1996). *Visual Design in Dress, 3rd ed.* Englewood Cliffs, NJ: Prentice Hall, Inc.

Dickerson, K.G. (1998). *Textiles and Apparel in the Global Economy, 3rd ed.* Upper Saddle River, NJ: Merrill/Prentice Hall.

Gioelo, D.A. and Berke, B. (1979). *Fashion Production Terms.* New York, NY: Fairchild Publications.

Glock, R.E. and Kunz, G. (1995). *Apparel Manufacturing, 2nd ed.* Upper Saddle River, NJ: Merrill/Prentice Hall.

Guerin, Polly. (1987). *Creative Fashion Presentations.* New York, NY: Fairchild Publications.

Hoffman, K. and Rush, H. (1988). *Micro-electronics and Clothing.* New York, NY: Praeger.

Home Economics Curriculum Center. (1990). *Instutitional Maintenance Reference Book.* Lubbock, TX: Texas Tech University.

Hudson, P.B. (1989). *Guide to Apparel Manufacturing.* Greensboro, NC: Mediapparel.

Ireland, P.J. (1987). *Encyclopedia of Fashion Details.* Englewood Cliffs, NJ: Prentice Hall, Inc.

Jarrow, J. and Dickerson, K.G. (1997). *Inside the Fashion Business, 6th ed.* Upper Saddle River, NJ: Prentice Hall, Inc.

Jernigan, M.H. and Easterling, C.R. (1990). *Fashion Merchandising and Marketing.* New York, NY: Macmillan Publishing Co.

Miller, H. (1996). *Free Trade vs. Protectionism.* New York: H.W. Wilson Co.

Moran, R. and Abbott. J. (1994) *NAFTA: Managing the Cultural Differences.* Houston: Gulf Publishing Co.

Pegler, M.M. (1998). *Visual Merchandising and Display, 4th ed.* New York, NY: Fairchild Publications.

The Reader's Digest Association, Inc. (1995). *Reader's Digest Complete Guide to Sewing, rev. ed.* Pleasantville, NY: The Reader's Digest Association.

Ross, A. (1997.) *No Sweat: Fashion, Free Trade, and the Rights of Garment Workers.* New York: Verso Books.

Tate, S.L. and Edwards, J. (1990). *Inside Fashion Design, 3rd ed.* New York, NY: Harper and Row.

Tortora, P.G. and Collier, B.J. (2000). *Understanding Textiles, 6th ed.* Upper Saddle River, NJ: Prentice Hall, Inc.

Vanderhoff, J. (1991). *Clothing: Concepts and Construction.* Englewood Cliffs, NJ: Prentice Hall, Inc.

Periodicals

Apparel Industry Magazine. 1115 Northmeadow Parkway, Roswell, GA, 30076. *www.aimagazine.com*

ATI: America's Textiles International. Published monthly by Billian Publishing, Inc., 2100 Powers Ferry Road, Atlanta, GA 30339.

Bobbin. Published monthly by the Bobbin Group of Miller Freeman Inc., PO Box 1986, Columbia, SC 29202. *www.bobbin.com.*

Daily News Record (DNR: The Newsmagazine of Men's Fashion and Retail). Published three times a week by Fairchild Publications, 7 W. 34th Street, New York, NY 10001-8191. *www.dailynewsrecord.com*

Earnshaw's Infants, Girls, Boys Wear Review. Published monthly by Earnshaw Publications, Inc. 475 Fire island Ave., Babylon, NY 11702.

Textile HiLights. Published quarterly by the American Textile Manufacturers Institute. ATMI Office of the Chief Economist, 1130 Connecticut Ave. NW, Suite 1200, Washington, DC 20036.

Textile World. Published monthly by Intertec Publishing, 6151 Powers Ferry Rd. NW, Atlanta, GA 30339. *www.textileworld.com*

Women's Wear Daily. Published daily by Fairchild Publications, 7 W. 34th Street, New York, NY 10001-8191. *www.wwd.com*

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TEXTILE AND APPAREL PRODUCTION, MANAGEMENT, AND SERVICES
OCCUPATIONALLY SPECIFIC COURSE MATERIALS
FALL 2000 UPDATE

The Curriculum Center for Family and Consumer Sciences is in the midst of a three-year process to develop a new series of instructional materials for seven occupationally specific training areas. Each series will consist of a *Reference Book* (text for students), *Student Activity Book*, and *Curriculum Guide* (teacher's resource).

The *Reference Book* and *Student Activity Book* for Textile and Apparel Production, Management, and Services are available as of fall 2000. The new Curriculum Guide is targeted for availability in fall 2002.

The attached crosswalk can be used to correlate content of the new 2000 publications with the 1991 curriculum guide for the predecessor course.

Certainly, the new publications contain additional and updated content that will not be found in the 1991 curriculum guide; thus, instructional strategies will not be found for all content in the new reference book. Also, the answer keys in the curriculum guide do not correspond to the new reference and activity books. However, the curriculum guide does contain many learning and evaluation experiences and teaching aids that are still applicable.

Tools such as this crosswalk, the TEKS Implementation Supplement, and the Training Plan Masters will assist the teacher in effectively utilizing all student and teacher components of the occupational series in the interim until the new Curriculum Guides are available.

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TEXTILE AND APPAREL PRODUCTION, MANAGEMENT, AND SERVICES

Crosswalk of the New Reference Book with the Existing Curriculum Guide

New Reference Book Chapters (2000)	•Chapters from the existing Apparel & Textiles Curriculum Guide (1991) that contain selected instructional strategy ideas
1	Chapter 1
2	Chapter 2
3	Chapter 3
4	Chapter 4
5	Chapter 5
6	Chapter 6
7	Chapter 8
8	Chapter 15
9	Chapter 16
10	Chapter 17
11	Chapter 18
12	Chapter 7
13	Chapter 9
14	Chapter 19

•The new 2000 Reference Books contain new and updated information not addressed in the 1991 Curriculum Guide nor the old Reference Book. Therefore, instructional strategies related to this new content information cannot be found in the 1991 Curriculum Guide. New curriculum guides, corresponding to the 2000 Reference Book and Student Activity Book, are scheduled for summer 2002.

TEXTILE AND APPAREL PRODUCTION, MANAGEMENT, AND SERVICES

Crosswalk of the New Reference Book with the Existing Curriculum Guide

New Reference Book Chapters (2000)	*Chapters from the existing Apparel & Textiles Curriculum Guide (1991) that contain selected instructional strategy ideas
15	Portions of Chapters 9 and 19
16	Chapter 10
17	Chapter 11
18	Chapter 12
19	Chapter 13
20	Chapter 14
21	Chapter 21
22	Chapter 20
23	Chapter 22

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*The new 2000 Reference Books contain new and updated information not addressed in the 1991 Curriculum Guide nor the old Reference Book. Therefore, instructional strategies related to this new content information cannot be found in the 1991 Curriculum Guide. New curriculum guides, corresponding to the 2000 Reference Book and Student Activity Book, are scheduled for summer 2002.

TEXTILE&APPAREL

PRODUCTION, MANAGEMENT, AND SERVICES

STUDENT ACTIVITY BOOK

BEST COPY AVAILABLE

FAMILY AND CONSUMER SCIENCES EDUCATION • TEXAS EDUCATION AGENCY • AUSTIN, TEXAS

Textile and Apparel Production, Management, and Services

Student Activity Book

Developed and disseminated by:
The Curriculum Center for Family and Consumer Sciences
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Preface

The textile and apparel industries contribute to the economic health of the United States. In 1999, over 1.4 million people were employed by the textile and apparel industries. A multitude of textile and apparel career opportunities exist in such employment areas as apparel services, apparel production and management, textile and apparel design, and fashion merchandising and retail management. In addition, many employment opportunities related to textiles and apparel exist for family and consumer sciences professionals and for entrepreneurs. Employment is available at a variety of levels ranging from beginning jobs that are open to the inexperienced, to professional level positions that require a college education or other extensive specialized training.

Publications in the *Textile and Apparel Production, Management, and Services* series provide information about various segments of the textile and apparel industries. Some employment situations will fit the descriptions provided more closely than others. Therefore, hands-on experience and use of other resource materials are important components of the total training experiences needed by students interested in pursuing career opportunities in the textile and apparel industries.

This Student Activity Book complements the other documents in the *Textile and Apparel Production, Management, and Services* set of materials. The instructional materials designed for the textile and apparel occupational area include the following three components:

- The *Reference Book* provides information needed by employees in the textile and apparel occupational area. Each chapter begins with a "Chapter Focus" (the Texas Essential Knowledge and Skills addressed in that chapter) and a "Chapter Vocabulary." Terms listed as vocabulary may be located quickly by using the index. Within the text, italicized, boldfaced vocabulary terms are included with definitions or explanations. Illustrations of equipment and procedures used in the industry today aid in student learning. Throughout the chapter, "Essential Questions" boxes pose important questions to students about the material they have read. At the end of each chapter, the content is summarized in "Chapter Highlights."

- The *Curriculum Guide* provides information needed by teachers. Each chapter consists of a variety of instructional strategies for use in the classroom. Instructional strategies should be selected based on the local instructional arrangement, the level of students' abilities and experience, job situations, and time available. Teaching Aids are included for use in implementing the instructional strategies. An Answer Key is also provided for the activities in the Student Activity Book.

- The *Student Activity Book* provides a variety of pencil-and paper activities designed to reinforce the concepts presented in the Reference Book. Activities are designed to correlate with essential information presented in each chapter.

The *Textile and Apparel Production, Management, and Services* documents are part of an occupational education series which focuses on a broad range of employment opportunities. Each title in the series addresses one occupational training area. The materials may be used for one or two years of instruction. Curriculum materials for the other occupational areas in family and consumer sciences are available from The Curriculum Center for Family and Consumer Sciences, Texas Tech University, Box 41161, Lubbock, Texas, 79409-1161.

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Chapter 1

The Textile and Apparel Industries

Chapter Focus

The following Essential Knowledge and Skills are discussed in Chapter 1:

3C Analyze the impact of technology on production of fibers, yarns, and fabrics.

4D Describe the impact of production and quality control systems on the worker, product costs, and quality.

5C Determine uses of technology in apparel design and production.

7I Analyze the impact of technology and societal patterns on commercial textile and apparel care operations.

12B Analyze the future employment outlook in the textile and apparel industries.

12H Describe the size, scope, and importance of the textile and apparel industries.

12I Describe the impact of international trade practice on the textile and apparel industries and on U.S. economics.

13C Analyze legal aspects of the textile and apparel industries.

Introduction

Textiles and apparel are basic to human life. Clothing is the most obvious product of the textile and apparel industries. However, there are many other uses for textiles. The textile and apparel industries produce a great number of products and employ a tremendous number of people. Chapter 1 explains the history and importance of the textile and apparel industries. Routine tasks associated with different operations are addressed, as well as the effects of technology on these tasks.

Activity 1-1 • Short Answer

Directions

To review terms associated with the textile and apparel industries, respond to the following items. Record your answers in the spaces provided.

1. Differentiate between the terms *textile* and *apparel*: ____________________

2. Explain the term *textile industry*: ____________________

List six operations involved in this industry.

(1) ____________________ (4) ____________________
(2) ____________________ (5) ____________________
(3) ____________________ (6) ____________________

3. Explain the term *apparel industry*: ____________________

List five operations involved in this industry.

(1) ____________________ (4) ____________________
(2) ____________________ (5) ____________________
(3) ____________________

4. Define the term *sewn products industry*: ____________________

Provide two examples of sewn products categories.

(1) ____________________ (2) ____________________

5. Define the terms *softgoods chain* and *softgoods industry*: ____________________

6. Provide two examples that demonstrate the important role that textiles play in society.

(1) ____________________
(2) ____________________

Directions

Using the space provided below, write a paragraph summarizing the growth of the textile and apparel industries in the United States since colonial days.

Growth of the Textile and Apparel Industries in the United States

Activity 1-3 • True/False

Directions

Read the following statements about the history of the textile and apparel industries. If the statement is True, circle the letter T to the left of the statement. If the statement is False, circle the letter F. If the statement is False, rewrite the statement to make it True.

T F 1. In the late 1700s, cotton produced in the Southern United States was exported primarily to England.

____

T F 2. The textile industry grew in New England and expanded to the West during the 1800s.

____

T F 3. Francis Lowell's cotton gin helped the textiles industry develop into a major part of life in the United States.

____

T F 4. Isaac Singer invented the sewing machine in the 1800s.

____

T F 5. Rayon was the first manufactured fiber, followed by the creation of such fibers as nylon and polyester.

____

T F 6. The fashion industry in the United States began in the area around New Jersey.

____

T F 7. Small apparel factories known as sweat shops employed many immigrants.

____

T F 8. Mercantile stores were established to provide one or two specialty items to customers.

____

T F 9. The industrial revolution allowed more products to be produced, which encouraged increased selling to customers.

____

T F 10. As the history of retail evolved, different types of stores developed.

____

Activity 1-4 • Sentence Completion

Directions

The statements below cover international trade and technology in the textile and apparel industries. Complete the following sentences by placing the correct responses in the blanks provided.

1. When the value of goods imported into a country is more than the value of goods exported, a(n) ______________________________ is created.

2. The rules for textile and apparel trade were stated in the signed agreement commonly known as the ______________________________.

3. Goods purchased in one country from another country are called ______________________________.

4. Goods manufactured in one country and sold to another country are ______________________________.

5. The comprehensive and powerful body established to handle and monitor world trade is the ______________________________.

6. Improving a process through the use of inventions or methods is called ______________________________.

7. Many preassembly jobs, such as the pattern-making process, have been improved by the use of ______________________________.

8. The automated manufacturing system that requires fewer people and less-skilled workers to perform tasks is known as ______________________________.

9. The automated system that involves both computerized design and automated manufacturing is known as ______________________________.

10. The computerized information system used to run automated order processing, warehouse, and shipping activities is known as ______________________________.

Activity 1-5 • Short Answer

Directions

To review legal aspects of the textile and apparel industries, respond to the following items. Record your answers in the spaces provided.

1. Identify the responsibilities of the Federal Trade Commission (FTC). ____________

2. State the reasons for designing the Wool Products Labeling Act of 1939. ____________

3. Define the following terms according to FTC standards.
   (1) Wool: ____________
   (2) Recycled wool: ____________
   (3) Virgin wool: ____________

4. Identify one labeling requirement covered under the Fur Products Labeling Act of 1952.

5. List four pieces of labeling information required by the Textile Fiber Products Identification Act of 1960.
   (1) ____________
   (2) ____________
   (3) ____________
   (4) ____________

6. List three criteria that labels must provide according to the Care Labeling Regulation of 1972.
   (1) ____________
   (2) ____________
   (3) ____________

7. Explain the purpose of the Flammable Fabrics Acts of 1953. ____________

Chapter 2

Textile and Apparel Career Opportunities

Chapter Focus

The following Essential Knowledge and Skills are discussed in Chapter 2:

12A Determine preparation requirements for various levels of employment in a variety of careers in the textile and apparel industries.

12C Describe entrepreneurial opportunities in the textile and apparel industries.

Introduction

The textile and apparel industries offer many exciting and rewarding career opportunities. Some jobs allow people with high school training to be employed while they gain skills and experience. Other jobs require special training or several years of education.

Chapter 2 identifies the responsibilities of textile and apparel jobs in the areas of apparel services, apparel production and management, textile and apparel design, and fashion merchandising and retail management. Information is provided also about professional family and consumer sciences occupations and entrepreneurial opportunities.

Activity 2-1 • Career Investigation

Directions

In the left column below, list nine examples of jobs in apparel services. Include (I) three entry-level jobs, (II) three jobs requiring advanced training, and (III) three jobs that require college or professional training. In the right column, provide the job description for each example job listed.

I. Entry Level or High School

Examples of Jobs	Job Descriptions
1.	
2.	
3.	

II. Advanced Training

4.	
5.	
6.	

III. College or Professional Level

7.	
8.	
9.	

Activity 2-2 • Sentence Completion

Directions

The statements below review apparel production and management. Complete the sentences by placing the correct responses in the blanks provided.

1. The process by which fabric is changed into finished garments for purchase by consumers is ________________________________.

2. The process of custom making garments for specific customers, often done by a dressmaker or tailor, is called ____________-________________________ production.

3. Manufacturers, jobbers, or contractors are three types of firms who perform ________________________________ production.

4. Apparel products that have a specific name owned by the company on their label or hang tags are known as ____________ ________________________.

5. An apparel manufacturer may conduct all aspects of its operation in one plant or may be organized as a(n) ________________________________.

6. A business that designs, produces, and markets garments with its own brand label is a(n) ____________ ________________________.

7. A business that usually develops ideas for looks or designs, selects the fabric for the designs, and markets the finished products is a(n) ________________________________.

8. In the textile and apparel industries, the term *piece goods* is another name for ________________________________.

9. A business that produces apparel for jobbers or for manufacturers who have more work than can be produced in their plants is known as a(n) ________________________________.

10. ________________________ merchandise is made specifically for a particular retailer.

11. In New York City, Seventh Avenue or Fashion Avenue is known as the ________________________________.

12. A ________________________ is a production arrangement that does not use a manufacturing plant; the company owner contracts with individuals who sew garments in their home.

Activity 2-2 • Sentence Completion, cont'd.

13. All garments produced by a single manufacturer that look exactly alike make up one ________________________________.

14. All of the styles designed and produced for the same selling period or season make up what is called a line or ________________________________.

15. Clothing items for which demand is based more on the wants and demands of customers than on consumer replacement are known as ________________________________.

16. Clothing items for which demand is based more on consumer replacement needs than on wants are known as ________________________________.

17. Women's apparel is influenced more by ________________________________ than any other category of the apparel industry.

18. A particular time frame for the production and sales life of a collection of styles is called a(n) ________________________________.

19. In order to distinguish between different production styles, manufacturers will assign each a style number or ________________________________.

20. Apparel manufacturers show their collection to retailers during a time period called ________________________________.

Activity 2-3 • True/False

Directions

Review example jobs, job descriptions, training requirements, and personal qualities needed for employment in textiles and apparel design occupations by completing the following activity. Read each statement. If the statement is **True**, circle the letter **T** to the left of the statement. If the statement is **False**, circle the letter **F**. If the statement is **False**, rewrite it to make it **True**.

T F 1. A sketching assistant sketches precise technical drawings of constructed garments and attaches fabric and trim swatches mainly for designer's records.

____

T F 2. A weaver creates original designs for new types and styles of clothing.

____

T F 3. A person can become a colorist immediately following high school graduation.

____

T F 4. A textile designer creates various color combinations of existing textile designs.

____

T F 5. A roller engraver uses the screen printing process to squeeze colored print paste through fabric mesh onto fabric by hand using automated machinery.

____

T F 6. A textile chemist requires professional training as the job requires research and development of new fibers.

____

T F 7. A person responsible for making a sample garment from muslin using a designer's sketch is called a sample maker.

____

T F 8. A sketcher does detailed technical drawings of designs for lace and embroidery.

____

T F 9. A screen printer position requires advanced training.

____

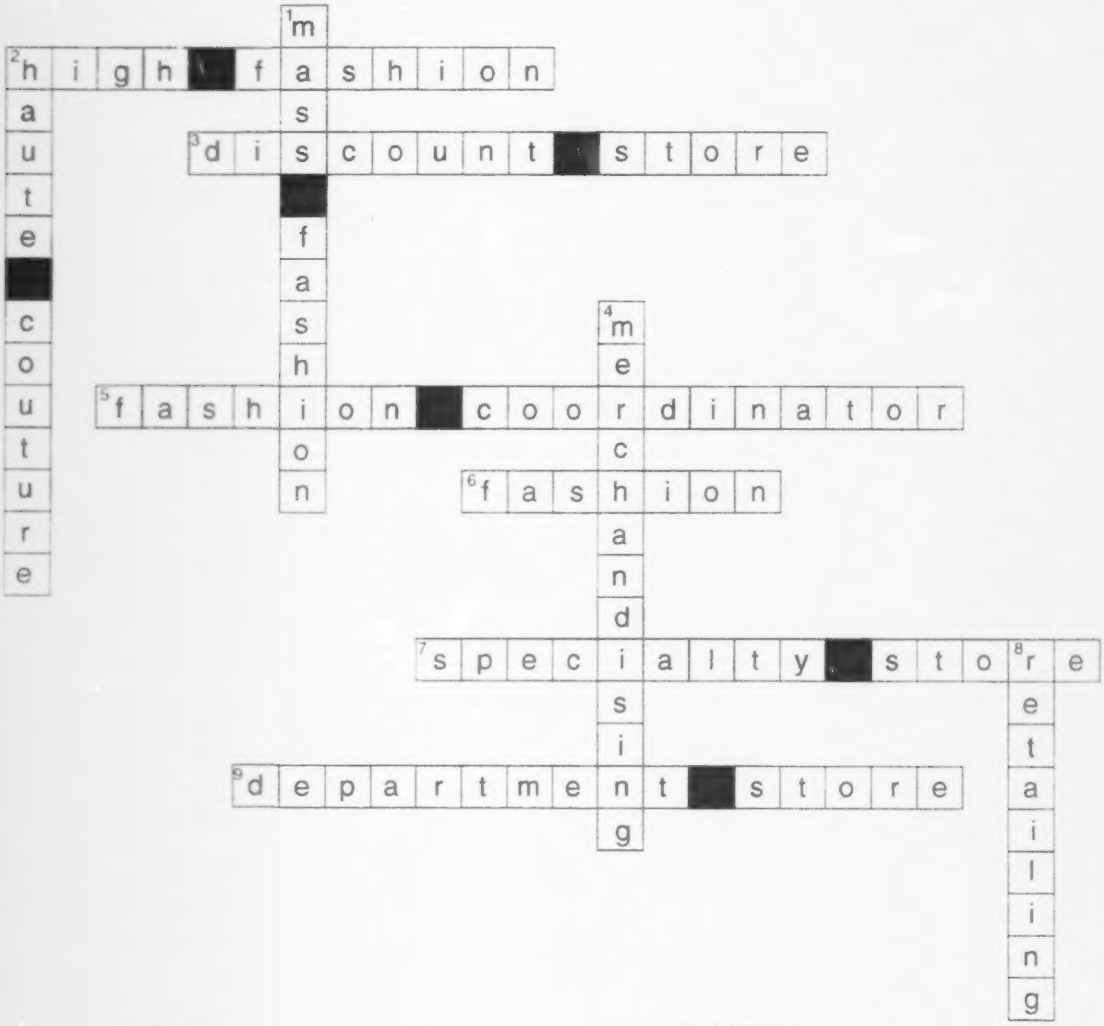
T F 10. To work as a weaver, a person needs college or professional level training.

____

Activity 2-4 • Short Answer

Directions

The following crossword puzzle has the answers already filled in, but the clues are missing. Down the left side of a separate sheet of notebook paper, list the numbers printed below under Across and Down. Beside each number, write a clue for each answer. Accurate clues will summarize jobs, job descriptions, training requirements, and personal qualities needed for employment in fashion merchandising and retail management.



ACROSS

2.

3.

5.

6.

7.

9.

DOWN

1.

2.

4.

8.

Directions

In the space below, write a poem, paragraph, or rap that describes various employment opportunities for family and consumer sciences professionals.

Activity 2-6 • Multiple Choice

Directions

Review entrepreneurial activities by completing the following exercise. For each item, select the best answer from the choices provided. Place the letter of the response in the blank to the left of the number.

_____ 1. A legal business relationship in which, according to a written agreement, some owners have a limited liability for business debts and are not involved in day to day operations is known as a
A. franchise
B. general partnership
C. limited partnership
D. sole proprietorship

_____ 2. The freedom of individuals to organize and operate businesses for profit in a competitive system without governmental interference is called
A. capitalism
B. free enterprise
C. profit
D. sole proprietorship

_____ 3. A right or license granted to an individual or group to market a company's goods or services is known as a
A. franchise
B. general partnership
C. limited partnership
D. sole proprietorship

_____ 4. People who own and operate their own businesses are called
A. corporations
B. entrepreneurs
C. franchisees
D. franchisers

_____ 5. A business owned by one person is called a
A. franchise
B. general partnership
C. limited partnership
D. sole proprietorship

_____ 6. A person who invests capital in exchange for the expertise and widely-known product image of the franchiser is called a
A. corporation
B. entrepreneur
C. franchisee
D. limited partnership

Activity 2-6 • Multiple Choice, cont'd.

_____ 7. The economic system of the United States is
A. capital
B. capitalism
C. socialism
D. profit

_____ 8. A legal business relationship in which a group of persons join to create an entity treated separately by law is a
A. corporation
B. general partnership
C. limited partnership
D. franchise

_____ 9. The ultimate goal of an entrepreneur is to make a
A. capital
B. franchise
C. profit
D. sole proprietorship

_____10. A legal business relationship in which two or more individuals share responsibilities, resources, and profits equally is a
A. franchise
B. general partnership
C. limited partnership
D. sole proprietorship

Activity 2-7 • Career Investigation

Directions

Family and Consumer Sciences Professionals work in varying occupations. In the box provided below, (A) list two occupations available to family and consumer science professionals, (B) provide brief job descriptions of the listed occupations, and (C) provide the levels of training required to hold the given positions.

(A) Occupations	(B) Job Descriptions	(C) Required Levels of Training
1.		
2.		

Chapter 3

Employability Success in the Textile and Apparel Industries

Chapter Focus

The following Essential Knowledge and Skills are discussed in Chapter 3.

2A Identify routine tasks that employees may perform.

2B Follow procedures identified for performing tasks.

2C Apply resource management procedures when completing assigned tasks.

11A Demonstrate effective verbal, nonverbal, written, and electronic communication skills.

11B Demonstrate effective methods to secure, maintain, and terminate employment.

11C Demonstrate positive interpersonal skills including conflict resolution, negotiation, teamwork, and leadership.

11D Evaluate the relationship of good physical and mental health to job success and achievement.

11E Demonstrate appropriate grooming and appearance for the workplace.

11F Demonstrate appropriate business and personal etiquette in the workplace.

11G Exhibit productive work habits and attitudes.

Introduction

Employees need many characteristics and skills to be successful. Employers look for these traits and skills when people apply for jobs. Employers also consider these qualities when evaluating employees after they are hired. Chapter 3 provides an overview of personal qualities, interpersonal skills, and productive work habits that will help employees perform routine and specialized tasks in the textile and apparel industries.

Activity 3-1 • Short Answer

Directions

To review effective communication, respond to the following items. Record your answers in the spaces provided.

1. Define *communication.* ____________________

____

2. Name the two factors that are vital to the communication process.

(1) ____________________ (2) ____________________

3. List three of the factors that can influence the flow of communication.

(1) ____________________
(2) ____________________
(3) ____________________

4. Explain *nonverbal communication.* ____________________

____

5. State three ways that word messages can be presented to others.

(1) ____________________
(2) ____________________
(3) ____________________

6. List the three important parts of verbal communication.

(1) ____________________
(2) ____________________
(3) ____________________

7. Explain why good telephone communication skills are important to a business.

____

____

8. Provide three general guidelines for telephone usage.

(1) ____________________
(2) ____________________
(3) ____________________

9. Give three guidelines to follow when it is necessary to leave the line.

(A) ____________________
(B) ____________________
(C) ____________________

10. Explain the best method to follow when taking a message.

11. Explain why personal phone calls should be limited to emergencies and urgent matters.

Activity 3-2 • True/False

Directions

Read each statement about communication with customers. If the statement is **True**, circle the letter **T** to the left of the statement. If the statement is **False**, circle the letter **F**. If the statement is **False**, rewrite it to make it **True**.

T F 1. Groaning and sighs are types of nonverbal communication.

____

T F 2. Tell every detail of a story to improve a conversation.

____

T F 3. A good communicator is tolerant of the other person's point of view.

____

T F 4. When you disagree with a customer's opinion, you should tell the customer he/she is wrong.

____

T F 5. Talking fast is good because it gets a point across more quickly.

____

T F 6. The ability to send a message is much more important than the ability to receive a message.

____

T F 7. Communication fails when a person does not listen to the message sent.

____

T F 8. To improve listening ability, concentrate on what the speaker is saying.

____

T F 9. Hearing involves understanding what is heard.

____

T F 10. Making occasional interjections, such as "How interesting," when someone is talking is rude and should be avoided.

____

Activity 3-3 • Writing

Directions

Complete the following activity to explain how personality and appearance influence relationships with customers. In the space provided, write a poem or rap that reflects your true personality. You may want to include these personality traits in your creation: friendliness, cheerfulness, courtesy, and tact. The poem or rap does not need to rhyme.

Who Am I?

Activity 3-4 • Evaluation

Directions

Part 1

Complete the following activity to identify general qualities needed for employment in any job. Honest self-evaluation can help a person determine strengths and weaknesses. Place a ✔ by the following personal qualities you consider strengths and an ✗ by the personal qualities you consider weaknesses. Circle the number of each quality that is needed for employment in any job.

✔ = personal strengths ✗ = personal weaknesses

_____ 1. I check my clothing and general appearance before going to school or work.

_____ 2. I make needed repairs to clothing on a regular basis.

_____ 3. I stay aware of fashion trends and choose clothing that is fashionable.

_____ 4. I select clothing that fits properly.

_____ 5. I wash my hair as needed to maintain cleanliness and style my hair daily.

_____ 6. I maintain fresh breath and clean teeth by brushing, flossing, and practicing dental hygiene.

_____ 7. I keep my hands clean and nails well manicured.

_____ 8. I take a bath or shower daily and use a reliable deodorant.

_____ 9. I select sensible shoes that are kept clean and in good repair.

_____ 10. I maintain proper posture when sitting, standing, and walking.

_____ 11. I make a good habit of smiling.

_____ 12. I pronounce words correctly and use correct grammar.

_____ 13. I speak loud enough to be heard and use a pleasant tone of voice.

_____ 14. I am willing to listen to other people's views and opinions.

_____ 15. I am prompt about completing assigned tasks.

_____ 16. I am willing to tackle ordinary and unusual tasks if necessary.

_____ 17. I am dependable and show consistency in my work.

_____ 18. I keep my temper under control in stressful situations.

_____ 19. I avoid talking about other employees and supervisors.

_____ 20. I keep a positive attitude and show enthusiasm and a willingness to learn.

Directions

Part 2

From the self-evaluation in Part 1, select three strengths and three weaknesses. Complete the box below by first listing the strengths and weaknesses in the designated areas. For each strength, briefly describe how this personal quality may be beneficial to you as an employee. For each weakness, outline a plan for improving the weakness.

Strength	Weakness
1.	1.
2.	2.
3.	3.

Activity 3-5 • Research

Directions

Analyze character traits that aid in the development of successful customer relations by completing the following activity. First, identify four character traits that are important in maintaining good customer relationships and write one in each box. Below each characteristic, list several things an employee can do to display these characteristics.

1. Characteristic

____

Ways to display this characteristic

____
____
____
____
____
____
____
____
____

2. Characteristic

____

Ways to display this characteristic

____
____
____
____
____
____
____
____
____

3. Characteristic

____

Ways to display this characteristic

____

____

____

____

____

____

____

____

____

4. Characteristic

____

Ways to display this characteristic

____

____

____

____

____

____

____

____

____

Activity 3-6 • Matching

Directions

This exercise will help to review the terms associated with routine tasks common to textile and apparel occupations. Match the term with its description. Place the letter of the term in the blank to the left of the description. Not all terms will be used.

Terms

A. Buy change
B. Change fund
C. Inventory
D. Perpetual inventory
E. POS system
F. Sales check
G. Sales commission
H. Scanners
I. Statement
J. Stock
K. Till

Descriptions

_____ 1. Sum total of merchandise carried by a store

_____ 2. Money placed in the cash drawer at the beginning of the business day

_____ 3. A computerized cash register that automatically records a variety of information

_____ 4. To obtain change from the cashier or business office

_____ 5. A written bill necessary for business records

_____ 6. A written record of a sale that serves as a receipt for a customer and as a record for the store

_____ 7. Optic readers that automatically read the price of an item and enter it into the cash register

_____ 8. Sum total of the number of merchandise items a business has on hand determined through a counting process.

_____ 9. A removable tray that has dividers for different denominations of coins and bills

_____ 10. The amount of money a salesperson earns from each sale

Activity 3-7 • Case Studies

Directions

Review methods for completing basic sales and service transactions successfully by completing the following activity. Pretend you are employed in a position where you deal with customers on a regular basis. In the space provided after each case study, identify one way you would respond to the situation in order to help the customer.

CASE STUDY 1

A customer has made a decision to purchase three dresses. The customer would like to purchase some accessories for the dresses, but she is having difficulty in making appropriate selections. What type of sales closer would you use in this situation?

CASE STUDY 2

A customer has asked for his purchase to be gift wrapped. The store does not offer gift wrapping services. What suggestions might you offer to ensure customer satisfaction?

CASE STUDY 3

A customer you are helping is trying to return a pair of jeans he previously purchased. After washing the jeans according to the instructions on the care label, the jeans came apart at the side seams. The store does not give cash refunds, but the store will give a store voucher. The customer wants to return the jeans for a full refund. How would you deal with the customer in order to avoid disappointment?

Activity 3-7 • Case Studies, cont'd.

CASE STUDY 4
A potential customer has entered your department where salary is based on commission only. How would you approach the customer?

CASE STUDY 5
A customer came to pick up some clothing from the dry cleaning business where you work. The customer checked the clothing before leaving the business. When the customer checked the clothing, she noticed a large area of discoloration on the front of a blouse. The customer was very upset when making this discovery. How would you show empathy in handling the situation?

Chapter 4

Workplace Safety

Chapter Focus

The following Essential Knowledge and Skills are discussed in Chapter 4:

2D Utilize safe and effective work habits, procedures, and time schedules for completing prescribed tasks.

5B Demonstrate safety practices when completing apparel production tasks.

6G Demonstrate safety practices when completing tasks related to the alteration, repair, and customization of textile and apparel products.

7B Explain how regulations pertaining to workplace safety, labor, and environmental issues affect the commercial textile and apparel care operation.

Introduction

Every year, many employees experience either job-related injuries or illnesses. The manufacturing industries usually report the largest number of workplace injuries. Department stores also report large numbers of injuries. Manufacturers, department stores, and other textile and apparel industries must be concerned with preventing injuries. Chapter 4 increases awareness of safety principles and procedures. With this increased safety awareness, individuals will be able to respond to accidents using the appropriate procedures.

Activity 4-1 • Short Answer

Directions

To review general safety programs and procedures, respond to the following items. Record your answers in the spaces provided.

1. Define *liability.* ____

2. Define *negligence.* ____

3. Provide a brief summary of steps that businesses can take to help prevent accidents and injuries. NOTE: Include at least four points as identified in the reading.

4. Employees are responsible for safe and effective practices especially when using specialized tools and equipment. List three practices in which employees can engage to help decrease the number of on-the-job injuries.

Activity 4-2 • Research

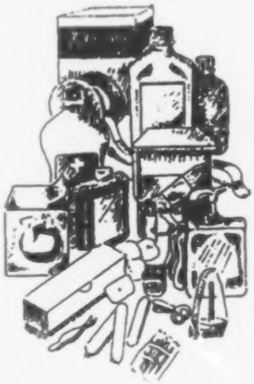
Directions

Review general safety procedures by completing the following activity. Unscramble each scrambled word below to list first-aid supplies. In the space provided, write the word and describe the purpose of each of the first-aid supplies. You will have to consult references to determine some purposes.

1. NTPLSIS ______________________ ____
2. RMETRHMSOETE ______________________ ____
3. TSRNAEBOB TOCTON ______________________ ____
4. PRSUY FO CCEAPI ______________________ ____
5. SLIHFALTGH ______________________ ____
6. RIFST-DIA OOKB ______________________ ____
7. WETZRESE ______________________ ____
8. ALAECNIM TONOIL ______________________ ____
9. SPMOE ATLSS ______________________ ____
10. QIDUIL APOS ______________________ ____

List additional first-aid supplies below and describe the purpose of each.

11. ______________________ ____
12. ______________________ ____
13. ______________________ ____
14. ______________________ ____
15. ______________________ ____



Activity 4-3 • Writing

Directions

Write three paragraphs discussing government regulations, codes, and standards related to safety in the workplace.

Government Protection

Activity 4-4 • Short Answer

Directions

To review ergonomics and the work environment, respond to the following items. Record your answers in the space provided.

1. Define *ergonomics*. ______________________________

2. Define *MSDs* as they relate to the work environment. ______________________________

3. List three examples of MSDS.
   (1) ______________________________
   (2) ______________________________
   (3) ______________________________

4. List three risk factors that can contribute to MSDs.
   (1) ______________________________
   (2) ______________________________
   (3) ______________________________

5. Provide six ergonomic suggestions recommended by OSHA.
   (1) ______________________________
   (2) ______________________________
   (3) ______________________________
   (4) ______________________________
   (5) ______________________________
   (6) ______________________________

6. Give two examples of how air quality can be improved in the work environment.
   (1) ______________________________
   (2) ______________________________

7. List three ways in which noise levels can be reduced in the work environment.
   (1) ______________________________
   (2) ______________________________
   (3) ______________________________

8. Provide a Web Site that serves as a good source of updated information on ergonomics.
   ____

Activity 4-5 • Research

Directions

Identify major causes of accidents by completing the following activity. In the spaces provided, write brief statements about various ways to prevent the accidents specified.

Preventing Falls

Preventing Cuts

Preventing Fatigue

Preventing Burns, Fires, Shocks, and Explosions

Preventing Back Strain

Activity 4-6 • True/False

Directions

Read each statement about fire emergency procedures. If the statement is **True**, circle the letter 'T' to the left of the statement. If the statement is **False**, circle the letter **F**. If the statement is **False**, rewrite the statement to make it **True**.

T F 1. Regular fire drills are important in preparing employees for emergencies.

T F 2. It is safe to lock a fire exit door as long as employees know where the key is kept.

T F 3. Fire systems such as smoke and heat detectors, fire alarms, and fire extinguishers should be inspected twice a year.

T F 4. Doors and windows in the area of a fire should be opened to allow firefighters access.

T F 5. Loose-fitting clothing is suitable to wear when working around heating elements or open flames.

T F 6. Water or flour should never be used to extinguish a grease fire.

T F 7. Most injuries happen when people panic or become confused.

T F 8. Employees should try to extinguish the fire first, then get help from a supervisor.

T F 9. Businesses may assign fire emergency duties to employees.

T F 10. Water can be used to extinguish smoldering items.

Chapter 5

Organizational Goals, Policies, and Procedures

Chapter Focus

The following Essential Knowledge and Skills are discussed in Chapter 5:

1A Contrast the organizational structure of selected businesses in the textile and apparel industries.
1B Describe how goals, policies, and procedures influence business structures.
1C Relate the impact of organizational goals, policies, and procedures to each individual's job performance.
1D Explain the importance of scheduling in managing employee work assignments.
1E Analyze demographic, economic, and societal factors influencing organizational goals, policies, and procedures.
13B Exhibit ethical practices as defined by the textile and apparel industries.

Introduction

Each business has specific goals, policies, and procedures. A ***goal*** is something a person or organization works to attain. A ***policy*** is an overall plan that states the goals and operating procedures of an organization. Policies are made to ensure the smooth operation of the business. Policies also enhance the relationships between employees and management and between staff members and the customers they serve. ***Procedures*** are step-by-step guidelines that help employees perform jobs efficiently with the same results each time. Procedural guidelines allow supervisors to fairly evaluate an employee's job performance.

Organizational goals, policies, and procedures are the focus of chapter 5. With this increased awareness, individuals will have a better understanding of expectations of textile and apparel businesses.

Activity 5-1 • Matching

Directions

This exercise reviews terms associated with organizational goals and policies. Match the term with its description. Place the letter of the term in the blank to the left of the description. Not all terms will be used.

Terms

A. Accountability
B. Chain of command
C. Company protocol
D. Goal
E. Management
F. Mid-management level
G. Mission statement
H. Organizational chart
I. Policy
J. Procedures
K. Supervision

Descriptions

_____ 1. An end result that a person or organization works to attain

_____ 2. An overall plan that states goals and operating procedures, which helps ensure the smooth operation of a business

_____ 3. Step-by-step guidelines that help employees perform jobs efficiently with the same results each time

_____ 4. A broad statement that explains the purpose or direction of the company

_____ 5. A structure of ranks within an organization according to the amount of authority each possesses

_____ 6. Illustrates the lines of authority within a business

_____ 7. The expected order of conducting communications between departments

_____ 8. The level of an organization where decisions are made and policies are set

_____ 9. The level of an organization where policies are interpreted and procedures are outlined

_____ 10. Involves answering to someone for work performed

Directions

Most successful companies develop a mission statement and other goals by focusing on the customer rather than on the goods or services produced by the company. Products and services change while customer needs last. Create a textile and apparel business, and describe it in the space provided. Write a mission statement for the business that addresses how it will serve the customer.

Business Description

Mission Statement

Activity 5-3 • Writing

Directions

Ethics are the principles and standards of conduct that govern a profession, business, or group of people. In the space provided below, write a short paragraph stating your opinion as to why businesses *should* or *should not* establish a written code of ethics for employees.

A Few Words About Codes of Ethics in Business

Activity 5-4 • Sentence Completion

Directions

Review how ethics, employee orientation, probation periods, attendance, performance appraisals, disciplinary action, dismissal, and resignation relate to organizational policies by completing the following sentences. For each item, place the correct response in the boxes provided.

1. A book that outlines company rules and lists information regarding insurance, sick leave, vacation, and other benefits is the ______________.

☐☐☐☐☐☐■☐☐☐☐☐☐

2. The voluntary relinquishing of a position by an employee is called ______________.

☐☐☐☐☐☐☐☐☐☐☐

3. A collection of information that documents the employee's job performance is called a(n) ______________.

☐☐☐☐☐☐☐☐■☐☐☐☐

4. The principles and standards of conduct that govern a profession, business, or group of people are called ______________.

☐☐☐☐☐☐

5. Theft or misuse of company property, which may be a reason for immediate dismissal without the usual review process, is an example of employee ___________.

☐☐☐☐☐☐☐☐☐☐

6. A process used to help new employees become familiar with a business is called ___________.

☐☐☐☐☐☐☐☐☐☐☐

7. A written summary of a specific position including the major responsibilities of the job and the experience and education necessary for the position is a(n) ___________.

☐☐☐■☐☐☐☐☐☐☐☐☐☐☐

8. Many professional groups or businesses have written a set of standards called a(n) ___________

☐☐☐☐■☐☐■☐☐☐☐☐☐

9. A process used to evaluate an employee is a(n) ______________.

☐☐☐☐☐☐☐☐☐☐☐■☐☐☐☐☐☐☐☐☐

10. Removal of an employee from a job because of insubordination, poor work performance, or other good cause is called ___________.

☐☐☐☐☐☐☐☐☐☐☐

Activity 5-5 • True/False

Directions

Review how vacations and sick leave, uniforms and dress codes, use of time clocks, identification badges, work-related injuries, complaints and grievances, and labor unions relate to the organizational structure of a business by completing the following activity. Read each statement. If the statement is **True**, circle the letter **T** to the left of the statement. If the statement is **False**, circle the letter **F**. If the statement is **False**, rewrite it to make it **True**.

T F 1. If uniforms are required, employees are usually required to make them.

____

T F 2. Incentives are rewards offered by employers that act as a motivation for employee productivity.

____

T F 3. In labor unions, the representative elected by the union membership works with management to negotiate better working conditions.

____

T F 4. If an employee has used up all vacation time, sick leave can be used for vacation time.

____

T F 5. Time clocks are used to accurately account for work hours completed by employees.

____

T F 6. Some companies will encourage employees to take vacation leave at less busy times during the year.

____

T F. 7. Wearing identification badges helps with security in large businesses.

____

T F 8. If an employee has a serious and legitimate disagreement with a work situation, he or she should first confer with other employees.

____

T F 9. Closed shop union membership is open to company employees but is not required.

____

T F 10. A time clock can be used in companies for arrival and departure time documentation.

____

Activity 5-6 • Writing

Directions

Review organizational procedures that influence the structure of a business by completing the following activity. Write Standard Operating Procedures that reflect what your working guidelines would be for a textile and apparel business. Write SOPs for four of the following items:

- daily routines
- lost-and-found
- time cards
- inspection checklists
- key control
- performance appraisals
- inventory control

SOP #1

SOP #2

SOP #3

SOP #4

Activity 5-7 • Application

Directions

Complete the following activities to determine how rotation schedules and shift schedules are used to manage employee work assignments. In each space provided, create the type of work schedule indicated.

1. **Create a rotation schedule** using the following employees: Lynn, Debra, Traci, Becky, Lacey, and Marilyn. The business is open Monday through Friday from 9 A.M. to 9 P.M and on Saturday from 9 A.M. to 7 P.M. The business is closed on Sunday. Becky, Debra, and Lynn can each work 40 hours per week, but Lynn cannot work Monday. Lacey and Marilyn can work 20 hours per week. And Traci is available a total of 10 hours a week: after school from 4 P.M. to closing and all day on Saturday. The general flow of business traffic stipulates the following staffing:
    - Two people on the floor at all times with three during the rush hours of 11 A.M. to 1 P.M. and 4 P.M. to 6 P.M. during the week. On Saturdays, staffing requires four employees during hours of operation.
    - Aside from Sunday, the staff members working 40 hours per week require an additional day off.
    - As a consideration to employees, it is recommended that each worker be granted a work day of **not less than** three hours.

    NOTE: Lunch and dinner breaks are calculated into the total hours.

Rotation Schedule

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday

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Activity 5-7 • Application, cont'd.

2. **Create a shift schedule** using the following employees: Jason, Bryce, Junelle, Marcus, Domingo, and Sonia. The business operates from 7 A.M. to 11 P.M. Monday through Friday. Scheduling should reflect the following criteria:
   - All employees can work up to 40 hours each except Jason and Sonia.
     - → Jason can work 30 hours.
     - → Sonia is a student who can work after 4 P.M. each day for a maximum of 25 hours.
   - Marcus and Domingo prefer to work the evening shift.
   - Bryce needs to work the morning shift.
   - Jason and Junelle can work either the morning or evening shift.

Shift Schedule						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday

475

Activity 5-8 • Matching

Directions

Review the methods used to compensate employees by matching the term with its description. Place the letter of the term in the blank to the left of the description. Each term may be used once, more than once, or not at all.

Terms

A. Bonus
B. Compensation
C. Incentive
D. Minimum Wage
E. Salary plus commission
F. Salary plus commission-over-quota
G Straight commission
H. Straight salary

Descriptions

_____ 1. A reward that acts as a motivation for an employee to be as productive as possible

_____ 2. A method that includes a set salary plus a percent of each sale

_____ 3. A specified amount of money paid to an employee for a specific number of hours worked

_____ 4. Set by law, the lowest amount of money an employee can be paid per hour

_____ 5. While providing a minimum level of security , this plan also encourages growth and rewards employees' extra efforts

_____ 6. The plan that pays employees a specific percentage of the total volume sold

_____ 7. Payment for work done

_____ 8. A method that includes a set salary plus a percentage of sales over a certain quota

_____ 9. This plan, primarily used to pay salespeople, is decreasing in use

_____ 10. Employee of the month programs are an example

Chapter 6

Textiles and Apparel: Terminology, Use , and Care

Chapter Focus

The following Essential Knowledge and Skills are discussed in Chapter 6:

3A Identify origins, properties, and qualities of natural and manufactured fibers.
3B Describe methods of fiber and yarn production.
3C Analyze the impact of technology on production of fibers, yarns, and fabrics.
3D Outline the textile design process from concept to finished product.
3E Differentiate types and methods of textile fabrication.
3F Summarize implications and methods of dyeing, printing, and finishing of textiles.
3H Determine factors affecting the cost of textile products
5C Determine uses of technology in apparel design and production.
7A Define terms commonly used in commercial textile and apparel care.
12G Apply correct textile and apparel terminology.

Introduction

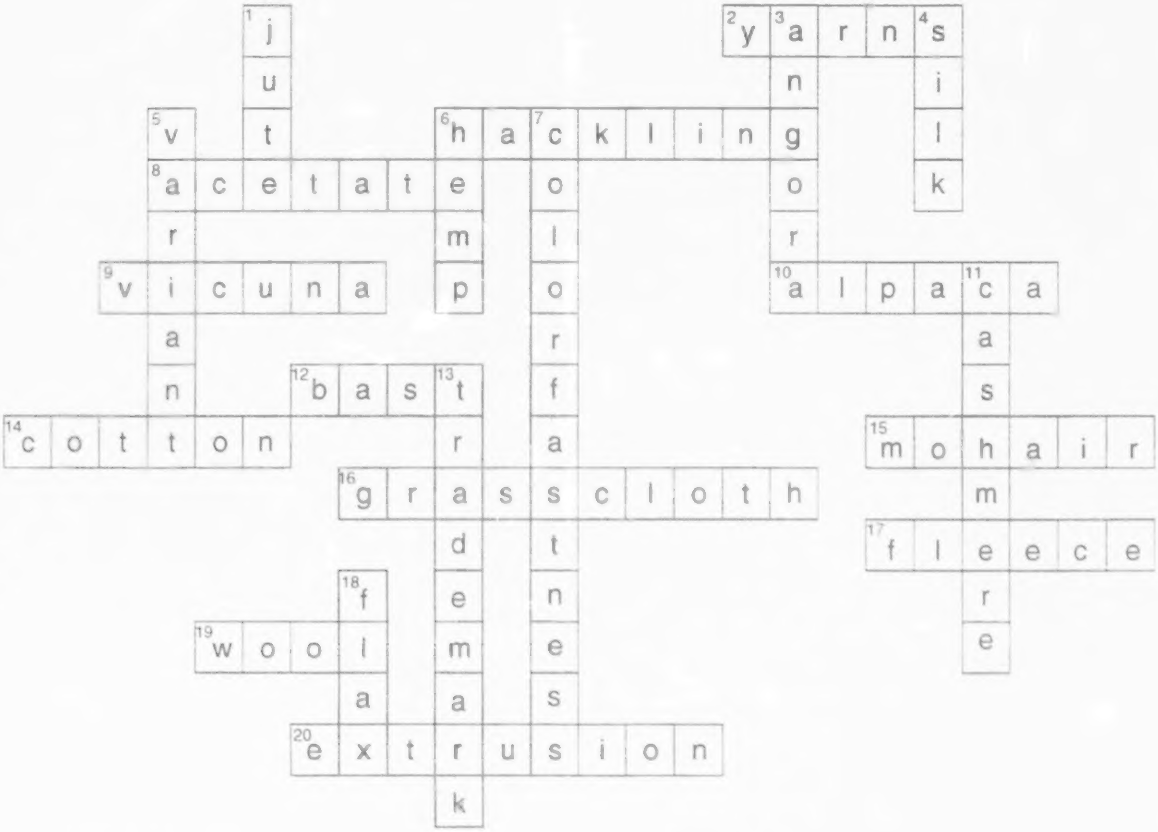
Becoming familiar with the most commonly used fabrics provides a basic understanding of both textile characteristics and of the procedures for handling various fabrics. In order to describe the qualities or characteristics of textile products or answer customers' questions, it is necessary to understand basic manufacturing procedures.

Identifying textile and apparel terms is the focus of chapter 6. With this increased awareness, individuals will have a better understanding of the use and care of textiles.

Activity 6-1 • Puzzle

Directions

The following crossword puzzle has the answers already filled in, but the clues about natural and manufactured fibers are missing. Down the left side of a separate sheet of notebook paper, list the numbers printed below under Across and Down. Beside each number, write a clue for each answer. NOTE: Clue 7 Down is provided for you.



ACROSS

2.
6.
8.
9.
10.
12.
14.
15.
16.
17.
19.
20.

DOWN

1.
3.
4.
5.
6.
7. The term used for color not fading easily over time
11.
13.
18.

Activity 6-2 • Multiple Choice

Directions

Analyze properties of various fibers by completing the following activity. Place the letter of the best answer in the blank to the left of each item.

_____ 1. The term that refers to a fiber's ability to spring back to original thickness after being flattened or compressed is
A. cohesiveness
B. density
C. loft
D. luster

_____ 2. The term that refers to a fiber's ability to be stretched or lengthened is
A. elongation
B. feltability
C. flexibility
D. resiliency

_____ 3. The ability of a fiber to gradually recover from strain or gradually stretch under a constant load is referred to as
A. cohesiveness
B. creep
C. crimp
D. elastic recovery

_____ 4. Formation of balls of fibers on the surface of fabric resulting from abrasion is called
A. feltability
B. filling
C. pilling
D. resiliency

_____ 5. The weight of a fiber in grams per cubic centimeter is known as
A. cover
B. density
C. hand
D. stiffness or rigidity

_____ 6. The feel of a fiber such a silky, soft, or crisp is called the
A. hand
B. loft
C. stiffness or rigidity
D. strength

Activity 6-2 • Multiple Choice, cont'd.

_____ 7. The fiber's ability to spring back to its natural position after folding, creasing, or deformation is called
A. elastic recovery
B. elongation
C. flexibility
D. resiliency

_____ 8. The ability of fibers to mat together is called
A. hand
B. feltability
C. loft
D. luster

_____ 9. A fiber's ability to withstand pressure without tearing, breaking, or bursting is referred to as
A. density
B. resiliency
C. stiffness or rigidity
D. strength

_____ 10. The term used to describe a wavy physical structure of a fiber is
A. cover
B. crimp
C. creep
D. elongation

Activity 6-3 • True/False

Directions

Summarize how the cotton, wool, and worsted spinning systems are used to produce spun yarn of different classifications by completing the following activity. Read each statement. If the statement is **True**, circle the letter **T** to the left of the statement. If the statement is **False**, circle the letter **F**. If the statement is **False**, rewrite it to make it **True**.

T F 1. The two main types of yarns are filament yarns and spun yarns.

____

T F 2. The cotton system, the wool system, and the worsted system are used to spin yarn from staple fibers.

____

T F 3. *Tow* is made of large bundles of continuous multifilaments twisted together.

____

T F 4. Fabrics made of spun yarns have a smoother surface and more luster than fabrics made from filament yarns.

____

T F 5. Spinning is the second stage in yarn manufacturing.

____

T F 6. Carding involves removal of matter such as twigs and burrs from fibers.

____

T F. 7. Woolen yarns go through the combing process.

____

T F 8. Drawing is the process of combining and pulling together several slivers.

____

T F 9. Ply refers to the number of strands or yarns twisted together.

____

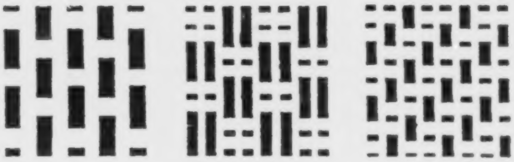
T F 10. Bulk yarns have small tight loops on the surface.

____

Activity 6-4 • Writing

Directions

In the box provided below, write an informative article explaining the production of fabric through felting, bonding, weaving, or knitting. Address at least two of the four processes listed.



Activity 6-5 • Multiple Choice

Directions

Review various finishes used to prepare fabric for use, to influence appearance of fabric, and to improve fabric performance by completing the following activity. Place the letter of the best answer in the blank to the left of each item.

_____ 1. The process where dye is added to the yarns before weaving or knitting is called
A. piece dyeing
B. solution dyeing
C. stock dyeing
D. yarn dyeing

_____ 2. Characteristics of fabrics that have been mercerized include the following:
A. fluffy, soft, textured appearance
B. fuzzy surface
C. increased fiber strength and absorbancy
D. increased firmness and weight

_____ 3. A process done to greige goods to remove foreign substances is called
A. bleaching
B. cleaning
C. crabbing
D. tentering

_____ 4. An ironing process used to smooth and press fabric is called
A. calendering
B. crabbing
C. singeing
D. tentering

_____ 5. A type of piece dyeing applied to fabrics containing certain fibers that absorb different dyes is
A. cross dyeing
B. printing
C. solution dyeing
D. striping

_____ 6. A process used on wool fabrics to set the width and position of the yarns is called
A. calendering
B. crabbing
C. singeing
D. tentering

Activity 6-5 • Multiple Choice, cont'd.

_____ 7. A process used to cause irregularly shaped cloth to be stretched or shrunk until it is even is
A. calendering
B. crabbing
C. singeing
D. tentering

_____ 8. The process where dye is added to the fibers before yarn processing is done is called
A. piece dyeing
B. solution dyeing
C. stock dyeing
D. yarn dyeing

_____ 9. The finish that can be applied through either the flat bed or rotary printing method is
A. heat dyeing
B. heat transfer printing
C. roller printing
D. screen printing

_____ 10. A process used to remove all natural coloring in fibers is called
A. bleaching
B. cleaning
C. crabbing
D. tentering

_____ 11. The process whereby a finish adds warmth to a fabric without additional weight is referred to as
A. calendering
B. crabbing
C. insulating
D. tentering

_____ 12. A finish applied to produce a textured effect on fabric is
A. embossing
B. singeing
C. tentering
D. wrinkle resistance

_____ 13. A process that involves adding a substance to a fabric to give it additional firmness, weight, and stiffness is known as
A. calendering
B. napping
C. shearing
D. sizing

_____ 14. The process where fabric is dyed after weaving is called
A. piece dyeing
B. solution dyeing
C. stock dyeing
D. yarn dyeing

_____ 15. A process that involves passing fabric rapidly through a flame to produce a smooth surface is called
A. flaming
B. mercerizing
C. singeing
D. tentering

_____ 16. A finish that produces a fluffy, soft-texturized fabric by brushing up fiber ends from the fabric surface is called
A. cutting
B. napping
C. shearing
D. sueding

_____ 17. A variation of napping and brushing in which the fiber ends are sheared very close to the surface of the fabric is known as
A. cutting
B. sizing
C. sueding
D. tentering

_____ 18. A finishing process where thread ends on fabric surfaces are cut on an even length so that the surface is smooth and regular is called
A. calendering
B. napping
C. shearing
D. sizing

_____ 19. A process that applies patterns or color designs to fabric is called
A. coloring
B. dyeing
C. tentering
D. printing

_____ 20. One type of printing that uses rotary screens or rollers to print dye onto paper before putting the paper and fabric through hot rollers is
A. heat dyeing
B. heat transfer printing
C. roller printing
D. screen printing

Activity 6-6 • Identification

Directions

To summarize qualities, uses, and care of various fibers and fabrics read the following "Who Am I" statements. After reading each item, write the name of the fiber in the blank below that item.

1. I drape and absorb dye very well. I ignite and burn easily and have a low resiliency.
Who Am I? ______________________________

2. I can be found in drapery and upholstery fabrics. I have a luxurious feel and appearance and must be washed with care.
Who Am I? ______________________________

3. I look great in fall and winter suits. I dry slowly, and insects can attack me. If you wash me with chlorine bleach, I may turn yellow.
Who Am I? ______________________________

4. I am expensive and soft. Remember that I like to be dry-cleaned and handled with care.
Who Am I? ______________________________

5. I can be machine washed and dried. I am quick drying, crisp, and resilient. I can be found in all types of garments and even in fire hoses.
Who Am I? ______________________________

6. I am used in table linens, bed linens, and towels. I make comfortable summer wear because I absorb moisture. I can be ironed, but my fibers will scorch with very hot iron temperatures.
Who Am I? ______________________________

7. I wrinkle easily, but am cool, lightweight and strong. Dry-cleaning leaves me crisp while washing makes me soft.
Who Am I? ______________________________

8. I am lustrous enough to be used in lingerie and strong enough to be used in making parachutes. I enjoy a good machine wash and tumble dry, but am prone to shrinkage.
Who Am I? ______________________________

9. I resemble wool but, unlike wool, I am resistant to moths. I am found in skiwear and sportswear because I am warm, retain my shape, and have a low absorbency so that I dry quickly.
Who Am I? ______________________________

10. I am a luxurious fabric found in chiffons, crepes, satins, and jerseys. I absorb dye well and can be attacked by moths.
Who Am I? ______________________________

Activity 6-7 • Research

Directions

Outline the fashion cycle and factors that influence consumer acceptance by writing a report about the changes that have occurred in the textile and apparel industries during the last ten years. Conclude by making projections for the future of the textile and apparel industries.

Chapter 7

Elements and Principles of Design

Chapter Focus

The following Essential Knowledge and Skills are discussed in Chapter 7:

4A Analyze elements and principles of design as related to apparel.

6E Apply elements and principles of design in altering, repairing, and customizing textile and apparel products.

Introduction

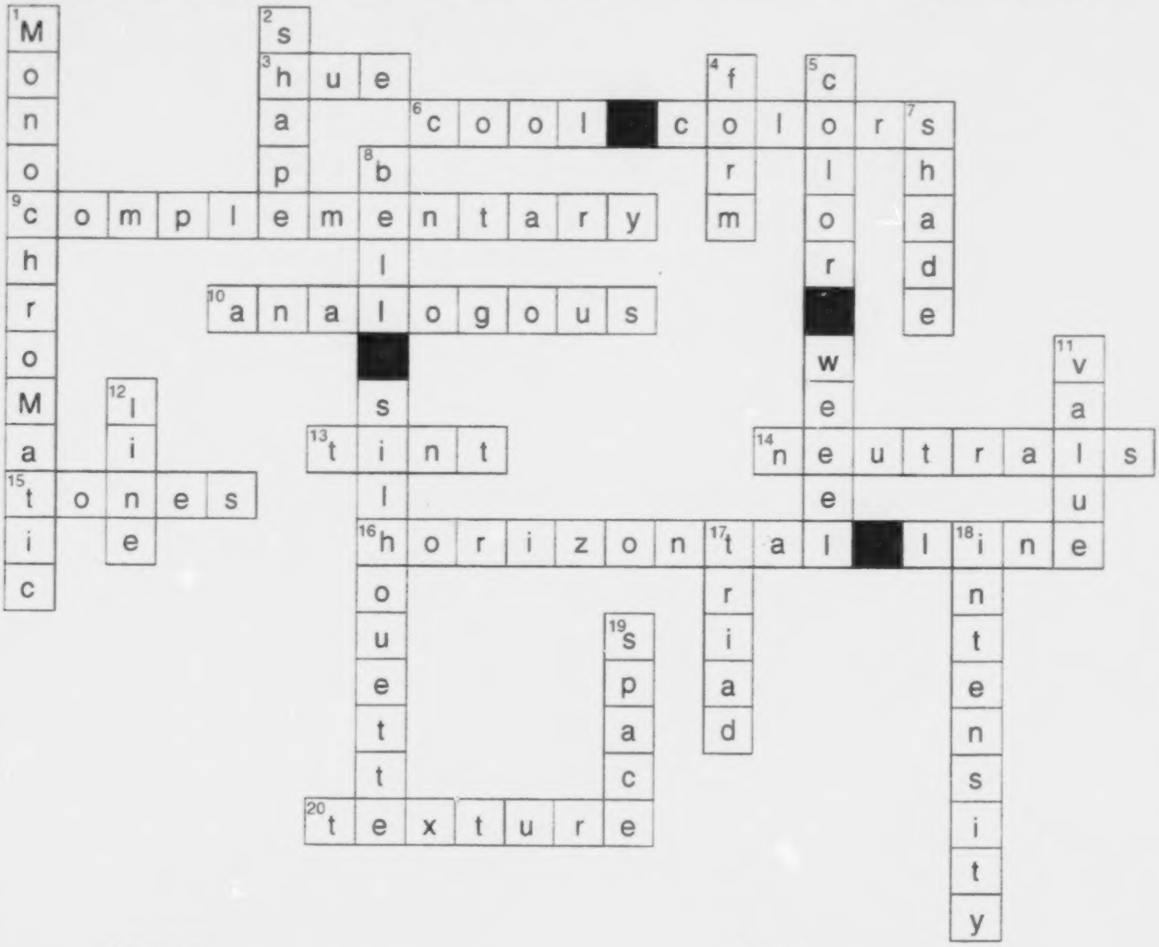
Design influences the clothes we buy and the fabrics we select. It is important for employees in the textile and apparel industries to distinguish between good and poor design.

Chapter 7 identifies the principles and elements of design. Understanding the relationship between the elements and principles will allow individuals to combine articles of clothing in an appropriate manner, describe fabrics and fashions to customers, develop fashion displays, and plan promotional events such as fashion shows.

Activity 7-1 • Puzzle

Directions

Review the elements of design by completing the following activity. The crossword puzzle has the answers already filled in, but the clues are missing. Down the left side of a separate sheet of notebook paper, list the numbers printed below under Across and Down. Beside each number, write a clue for each answer that pertains to an element of design. The clues should describe or explain each word.



ACROSS

3.
6.
9.
10.
13.
14.
15.
16.
20.

DOWN

1.
2.
4.
5
7.
8.
11.
12.
17.
18.
19.

Activity 7-2 • Scenarios

Directions

Designers use the elements of design to create optical illusions. *Line* is the element of design that indicates direction, length, width, and straightness. Each type of line creates a different mood or effect. Use this knowledge of line to complete the following exercise. Listed below are scenarios in which individuals are requiring expert advice on choosing the outfit designed to help them look their best. Read each item. Then use the blanks provided to respond to each of the related questions.

Scenario 1

Recently, Lisa has been offered employment as a district manager in a predominately male business. When shopping for career clothing, what do you recommend as the best choice of line for Lisa?

____

Why? ____________________________________

____

Scenario 2

Jorge is 5'4" tall and a little on the heavy side. He is eyeing a sports shirt with broad horizontal bands of black and blue. Do you recommend this sports shirt for Jorge?

____

Why? ____________________________________

____

Scenario 3

Jorge's wife, Saundra, is 5'. She has found a sundress designed in a T-line. Is this a good choice for Saundra?

____

Why? ____________________________________

____

Scenario 4

Pauline is shopping for an after-hours dress. She stands 5'4" and her weight is in relationship to her height. What do you suggest for Pauline?

____

Why? ____________________________________

____

Scenario 5

Sherylynn stands 5'9". She is proud of her height, but thinks that her figure is too full in the waist and hips. What do you suggest for Sherylynn?

____

Why? ____________________________________

____

Activity 7-3 • True/False

Directions

The following exercise is designed to help you review four of the five elements of design: line, shape, space, and texture. Read each statement. If the statement is **True**, circle the letter **T** to the left of the statement. If the statement is **False**, circle the letter **F**. If the statement is **False**, rewrite it to make it **True**.

T F 1. Garment lines can be structural, decorative, or both.

T F 2. The three classic silhouettes are bell, tubular, and front fullness.

T F 3. A closely spaced print fabric may appear more like a solid fabric than a print with widely spaced patterns.

T F 4. Types of fabric texture are rough, smooth, shiny, soft, and harsh.

T F 5. Heavy, bulky textures are attractive on the short, heavy figure.

T F 6. No more than two textures should be combined in a single garment.

T F. 7. Structural lines can be added by applying trim, accessories, and stitching.

T F 8. Shapes of squares and rectangles produce a feeling of completeness.

T F 9. Body proportions can be emphasized or de-emphasized by the outline of a garment.

T F 10. Texture can be determined more accurately through sight than through touch.

Activity 7-3 • True/False, cont'd.

T F 11. Curved lines suggest grace, youth, and subtle movement.

T F 12. Smooth satin will absorb light while a rough tweed will reflect light.

T F 13. Glossy textures emphasize figure defects and poor complexion.

T F 14. Taffeta is a stiff fabric suitable for the older or heavy figure types.

T F 15. Denim and chiffon are considered natural companions.

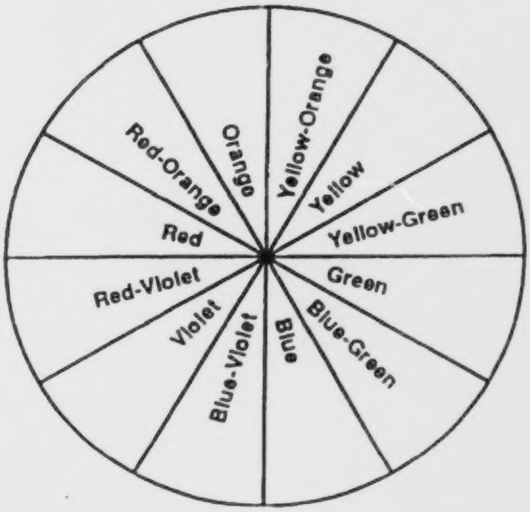
Activity 7-4 • Application

Directions

To review the color wheel and color harmonies, complete the following exercises.

A. 1. Complete the Basic Color Wheel illustrated below by applying the colors as indicated on the wheel. Use crayons, colored pencils, colored pens, or markers for applying the colors.

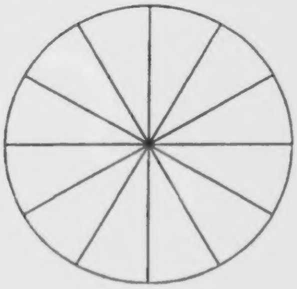
Basic Color Wheel



2. Using the completed color wheel, identify and label the following:
   a. Primary colors
   b. Secondary colors
   c. Tertiary or intermediate colors

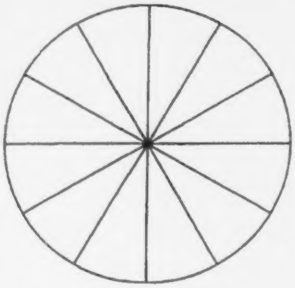
B. Define *monochromatic*: ______________________________

On the color wheel below, apply colors to illustrate a monochromatic color scheme.

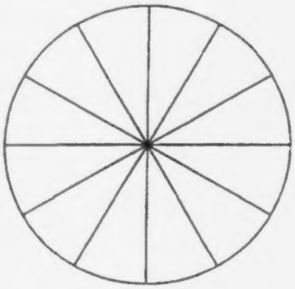


Activity 7-4 • Application, cont'd.

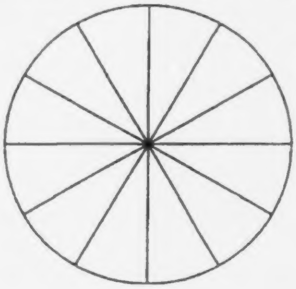
C. **Define** ***analogous*****:**
On the color wheel below, apply colors to illustrate an analogous color scheme.



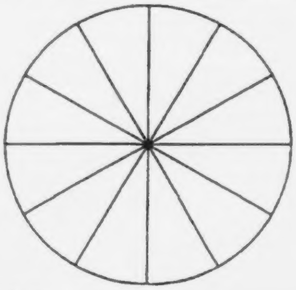
D. Define *complementary*:
On the color wheel below, apply colors to illustrate a complementary color scheme.



E. Define *split complementary*:
On the color wheel below, apply colors to illustrate a split complementary color scheme.



F. Define *triad*:
On the color wheel below, apply colors to illustrate a triad color scheme.



Activity 7-5 • Sentence Completion

Directions

Analyze the use of principles of design in apparel design, construction, and alteration. Complete the following items by writing in the word or words that best complete(s) each sentence.

1. The relationship of parts to each other and to the whole based on the way space is divided is called ______________________________.

2. Achieving rhythm through the use of continuous lines moving throughout a design is called rhythm by ______________________________.

3. The principle of design that produces a sense of equality between opposite elements and of restfulness is ______________________________.

4. When all parts of the garment fit together to create a pleasing, whole design, then ______________________________ is achieved.

5. A jacket with a side closing and one pocket is an example of informal or ______________________________ balance.

6. The principle of design that involves a series of similar objects ranging from small to large, large to small, thick to thin, or thin to thick is ______________________________.

7. The law of proportion, when applied to the size of objects used together, is called ______________________________.

8. When a design is exactly the same on both sides of the design center, it is called ______________________________.

9. Repetition, as well as contrast, can create ______________________________.

10. The principle of design that provides a sense of order and a quality of gracefulness is ______________________________.

Chapter 8

Quality in Apparel and Accessories

Chapter Focus

The following Essential Knowledge and Skills are discussed in Chapter 8:

3G Determine textile and apparel labeling requirements.

8C Summarize social, cultural, societal, and generational influences that affect clothing and accessory trends and choices.

Introduction

Knowledge of quality in apparel and accessories in an important aspect of employment in the textile and apparel industries. Whether involved in textile and apparel services, design, production, or merchandising, employees must be familiar with quality characteristics and influences.

Activity 8-1 • Case Study

Directions

The following case study assesses social influences that affect apparel and accessory choices. Several words are missing. Read the case study and use words from the word list to fill in the missing words. Write the words in the corresponding numbered blanks at the bottom of the page.

Word List

- accessories
- benefit
- first impression
- image
- lifestyle
- needs
- personality
- values
- wants
- wise

Maria is a sales associate in a specialty store that sells women's apparel and accessories. She has developed a loyal customer base because she is especially good at helping customers decide what quality of merchandise is individually suited for them. Because most of the customers regularly shop at the store, Maria has an opportunity to get to know each regular customer. She leads them to picture themselves as others see and remember them, and concentrates on helping them project a positive ____(1)____. For example, if Mrs. Jones is purchasing a suit to be worn in a job interview, Maria may ask the question, "When you meet your prospective employer for the first time, do you feel good about the ____(2)____ you will make wearing this suit?" In addition, Maria offers her customers input on any ____(3)____ that might enhance the garments.

Maria recognizes that each of her customers has a distinct ____(4)____, and she guides each in selecting apparel and accessory items that reflect these unique feelings, actions, and thoughts. She also becomes aware of the activities her customers like and recommends items consistent with each customer's ____(5)____. Maria gives consideration to the ____(6)____ the customer will receive once the merchandise is purchased. For example, Roberta participates in many sports activities and dresses in clothes that reflect her active life. Maria calls Roberta when the shop receives a new selection of items that look sharp yet sporty. She would not call Roberta to come view a new selection of highly sophisticated, tailored suits.

Often, customers may have a difficult time choosing between several items or deciding which items to purchase within budget limits. Maria tries to help them distinguish between ____(7)____, those items truly essential to a person, and ____(8)____, items they want because they believe they will enjoy the items. She also attempts to consider their principles and standards, or ____(9)____.

While Maria realizes that customers must make their own purchasing decisions, she feels very good about the assistance she is able to give to her customers in making ____(10)____ decisions. Because Maria takes time to get to know her customers and to help them consider the factors that influence their choices, her customers are more likely to be happy with their apparel and accessory purchases.

1. ____________________
2. ____________________
3. ____________________
4 ____________________
5. ____________________
6. ____________________
7. ____________________
8. ____________________
9. ____________________
10. ____________________

Activity 8-2 • Short Answer

Directions

Respond to the following items to review factors to consider when evaluating the quality of apparel and accessories. Record your answers in the spaces provided.

1. Compare the characteristics of high, medium, and low quality apparel and accessory items.

____

____

____

2. List and describe four factors that customers should check and compare when evaluating the quality of apparel and accessories.

(1) ______________________________

(2) ______________________________

(3) ______________________________

(4) ______________________________

3. List two characteristics that indicate quality in each of the following apparel construction details.

Buttons: ______________________________

Fabric: ______________________________

Hems: ______________________________

Sleeves: ______________________________

4. List two signs of quality for which a customer should look when selecting each of the following accessory items.

Eyewear: ______________________________

Handbags: ______________________________

Hosiery: ______________________________

Jewelry: ______________________________

499

Activity 8-3 • Matching

Directions

Complete the following activity to identify laws that influence the quality of apparel and accessories. Read each statement and decide what textile and apparel law best completes the statement. In each blank, write the letter that identifies the selected law. Answers may be used more than once.

A. 1972 Care Labeling Act
B. Flammable Fabrics Act
C. Fur Products Labeling Act
D. Textile Fiber Products Identification Act
E. Wool Products Labeling Act

1. The labeling of sheep's wool and other animal hair fibers is regulated by the ________.
2. Disposable, decorative, ornamental, or sheer items do not require labels describing maintenance procedures according to the ________.
3. The listing of fibers must be in order of the percentage by weight of fibers present in the product according to the ________.
4. Standards for flame-retardant children's sleepwear and apparel were developed as a result of the ________.
5. The ________ prohibits the use of misleading names that imply the presence of fibers not in a product.
6. Items must be clearly labeled as to their origin (imported or domestic) according to the ________.
7. Labels describing maintenance procedures must be attached to all finished garments and to fabric sold for making apparel according to the ________.
8. Information letting customers know that they are purchasing quality wool garments rather than garments resembling wool is mandated by the ________.
9. Manufacturers are allowed to use care symbols instead of written instructions on labels due to a 1997 revision to the ________.
10. The ________ prompted the development of flame-retardant household textile products such as mattresses, rugs, and upholstery fabrics.
11. The ________ specifies that the contents of paddings, linings, and stuffings are listed separately from the face fabric content of the product but must be listed on the same label.
12. A textile product is required to carry labels listing the generic names of fibers from which it is made according to the ________.

Activity 8-3 • Matching, cont'd.

13. Consumers are protected from deceptive information on fur product labels by the ________.

14. Garments containing only a fur trim require labeling according to the ________.

15. The requirement that all covered items must be clearly and visibly labeled as to whether they are imported or produced in the United States is stipulated by the ________.

16. The development of new fibers and finishes for production of flame-resistant fabrics is a result of the ________.

17. The earliest of these five textile and apparel laws to be passed is the ________.

18. The name of the animal that produced a fur must be identified according to the ________.

19. The sale of fabrics that burn faster, easier, and more intensely than other fabrics is prohibited by the ________.

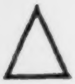
20. Labels are required to list the country of origin of imported furs according to the ________.

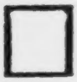
Activity 8-4 • Identification

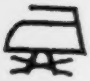
Directions

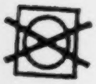
Use this exercise to check your understanding of fabric care symbols. Place the letter of each Fabric Care Symbol in the blank to the left of its correct Fabric Care Instruction. The symbols may be used more than once.

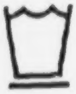
Fabric Care Symbols

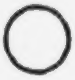
A.


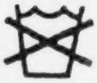
B.


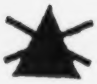
C.


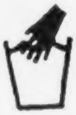
D.


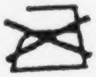
E.


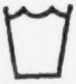
F.


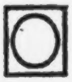
G.


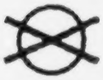
H.


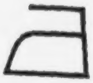
I.


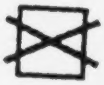
J.


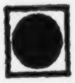
K.


L.


M.


N.


O.


P.


Fabric Care Instructions

_____ 1. Do Not Bleach
_____ 2. Dry
_____ 3. Do Not Iron
_____ 4. Do Not Wash
_____ 5. Any Bleach
_____ 6. Do Not Dry Clean
_____ 7. Normal Dryer Cycle
_____ 8. Machine Wash Permanent Press
_____ 9. Bleach
_____ 10. Machine Wash

_____ 11. Iron
_____ 12. Tumble Dry Any Heat
_____ 13. Machine Wash Normal
_____ 14. Tumble Dry No Heat
_____ 15. Iron No Steam
_____ 16. Tumble Dry
_____ 17. Dry Clean
_____ 18. Do Not Dry
_____ 19. Hand Wash
_____ 20. Do Not Tumble Dry

Activity 8-5 • Short Answer

Directions

The following activity will help you determine how consumer rights and responsibilities impact the manufacturing of apparel and accessories. The Consumer Bill of Rights is listed in the left column below. In the spaces provided, write an explanation of each of the consumer rights and then list two consumer responsibilities that accompany each of the consumer rights.

Consumer Bill of Rights	Explanation	Consumer Responsiblities
1. The Right to Consumer Education		1. 2.
2. The Right to Be Informed		1. 2.
3. The Right to Be Heard		1. 2.
4. The Right to Redress		1. 2.
5. The Right to Choose		1. 2.
6. The Right to Safety		1. 2.

Activity 8-6 • Case Studies

Directions

Read each case study and select the type of consumer agency from the list below to which you would direct each person. Write the type of agency in the blank provided. NOTE: There may be more than one correct answer for each case study.

Better Business Bureau
Consumer Office
Federal Agency
Industry Consumer Program

Case Study #1

Mrs. Hartzel receives mail offers for hosiery sold at discounted prices. Because she and her three daughters purchase several pairs of hosiery each month, she is considering purchasing a large supply. However, she knows nothing about marketing methods for hosiery and would like additional information, especially on mail order hosiery. What type of agency would you recommend she contact?

1. ______________________________

Case Study #2

Vera's employer has assigned her to research safety considerations in selecting children's apparel products. She is looking for fact sheets and information for a presentation she must compile. What type of agency might Vera contact for assistance?

2. ______________________________

Case Study #3

Raphael purchased a sports shirt from a discount store. Although he followed the care instructions carefully, the shirt color bled during the first laundering and the shirt was ruined. The manager of the discount store did not respond to Raphael's complaint, and friends have told Raphael that the store is often criticized for ignoring complaints. What type of agency would you recommend Raphael write for assistance in resolving the problem?

3. ______________________________

Case Study #4

Sonia is preparing to submit job applications for summer employment. She learned of a small specialty apparel store that will have a summer opening. She does not know anyone who can give her any information about the store. Sonia would like to know something about the store, including its background and reliability. What agency might provide Sonia with general information about the local business?

4. ______________________________

Case Study #5

Herman has rented a booth at a local crafter's market and wants to make table covers on which to display his crafts. The operators have instructed him that the table cover fabrics are to be flame-resistant as required by local laws. Herman is unsure where to go to purchase this special material. What agency might help Herman with this information?

5. ______________________________

Chapter 9

Selecting and Coordinating Apparel and Accessories

Chapter Focus

The following Essential Knowledge and Skills are discussed in Chapter 9:

8A Describe factors considered when coordinating clothing and accessories.

8B Demonstrate coordination of clothing and accessories for various occasions.

Introduction

Employees in the textile and apparel industries must often assist customers in coordinating apparel and accessories. Familiarity with apparel styles, application of elements and principles of design, and awareness of factors such as intended use, design, and construction materials enable employees such as salespersons, personal shoppers, and image consultants to provide this assistance.

Chapter 9 describes characteristics, types, and styles of apparel for infants and toddlers, women, and men. Features which distinguish various apparel styles are depicted. Guidelines relating to elements and principles of design are covered, as are factors to consider when coordinating apparel and accessories.

Activity 9-1 • Identification

Directions

Complete the following activity to identify basic styles of clothing for infants and toddlers. Read each style of clothing listed in the right-hand column. Place a check in the column to the left to indicate whether the clothing is designed for infants or toddlers.

Infant	Toddler	
		1. TRAINING PANTS
		2. PULLOVER SHIRT AND PANTS
		3. SLEEPING GOWN
		4. ROMPER
		5. DIAPER
		6. SHIRT WITH SNAPS
		7. KIMONO
		8. SLEEPER WITH GRIPPER FEET
		9. OVERALLS
		10. TWO-PIECE SLEEPER

Activity 9-2 • Identification

Directions

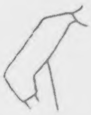
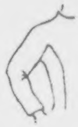
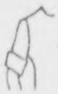
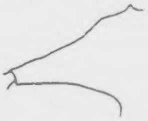
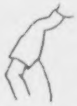
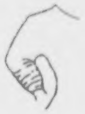
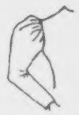
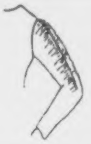
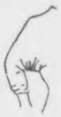
Part 1

One feature which characterizes blouse style is the sleeve. Compare the sleeves pictured in the following activity to determine if the style is set-in, kimono, or raglan. Write the letter that corresponds to the correct sleeve style in the blank to the left of each drawing.

a. set-in

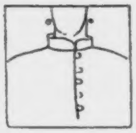
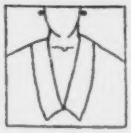
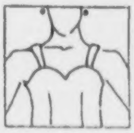
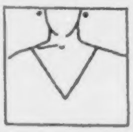
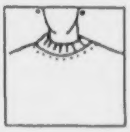
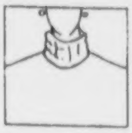
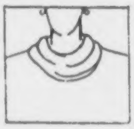
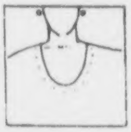
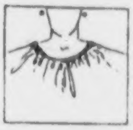
b. kimono

c. raglan

1. ______ 	2. ______ 	3. ______ 
4. ______ 	5. ______ 	6. ______ 
7. ______ 	8. ______ 	9. ______ 

Part 2

Directions: The other features that characterize particular blouse styles are the collar and/or neckline. Compare the drawings in the following activity to determine if each is a collar or a neckline. In the blank to the left of each drawing, write the letter *C* if it is a collar and the letter *N* if it is a neckline.

1. ______ 	2. ______ 	3. ______ 
4. ______ 	5. ______ 	6. ______ 
7. ______ 	8. ______ 	9. ______ 

Activity 9-2 • Identification, cont'd.

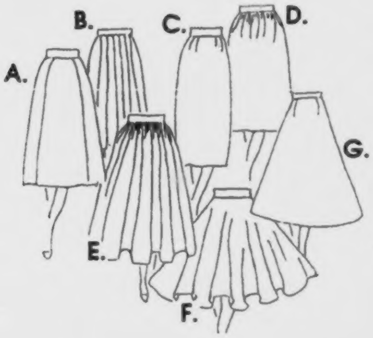
Directions

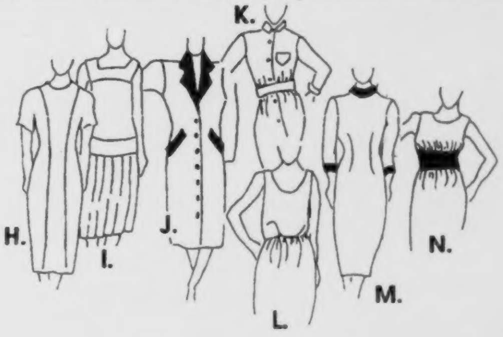
Part 3

Compare basic styles of women's skirts and dresses by completing the following activity. Read the case study below and follow the instructions given.

Marty is a salesperson in a women's apparel store. She has been asked by her supervisor to assist Mrs. Evans, who needs guidance in selecting several skirts and dresses as the basis of an updated wardrobe. The supervisor has instructed Marty to show Mrs. Evans basic style choices available in skirts and dresses and to point out characteristics which distinguish each style.

Examples of skirt and dress styles which Marty will show Mrs. Evans are depicted below. Beside the letter representing each style, write the name of the style and a brief description which Marty might give Mrs. Evans to help her distinguish style differences. The first answer is provided as an example.





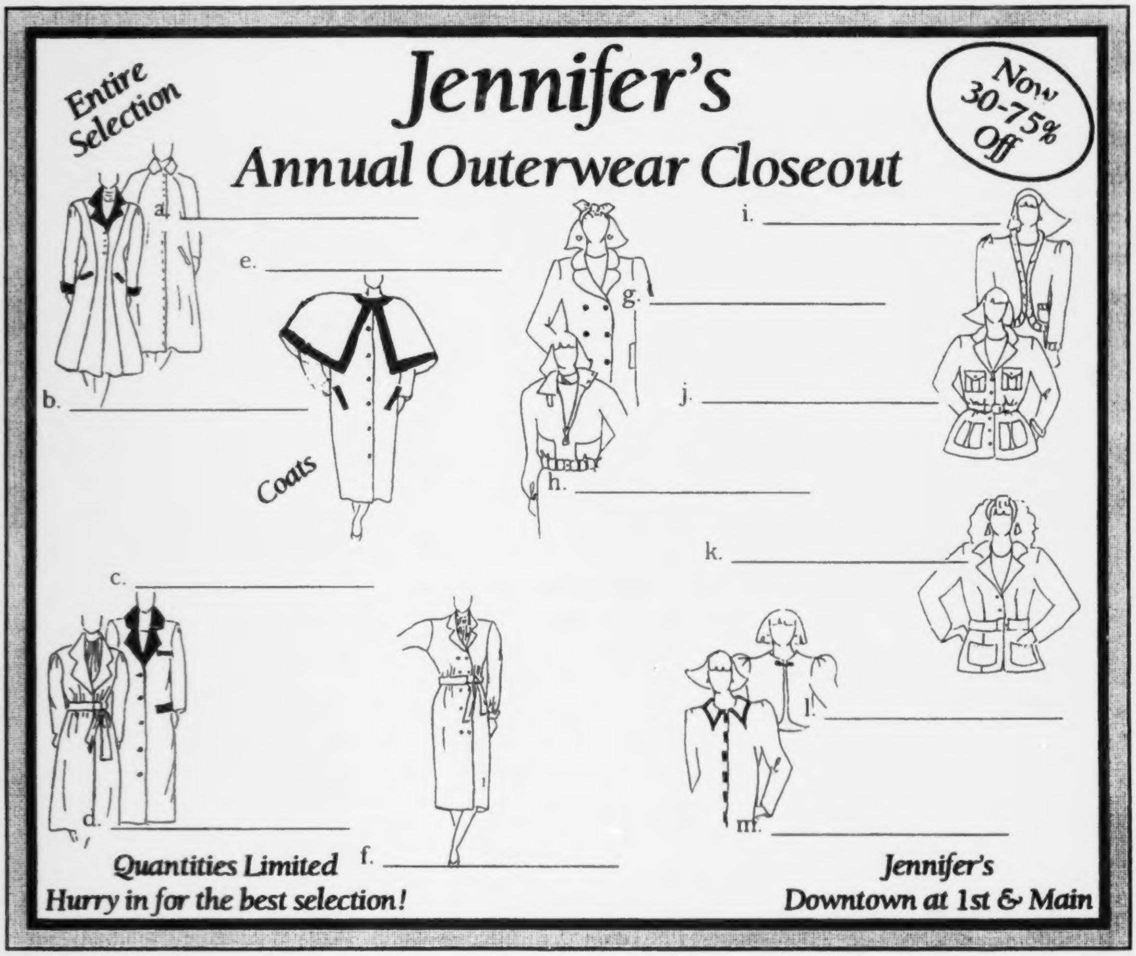
Style	Distinguishing Characteristics
A. gored skirt	vertical seams extending from the waistline down to the hem
B.	
C.	
D.	
E.	
F.	
G.	
H.	
I.	
J.	
K.	
L.	
M.	
N.	

Activity 9-3 • Identification

Directions

Part 1

Complete the following activity to identify basic styles of women's coats and jackets. View the examples depicted in the newspaper advertisement, and label each coat or jacket in the blank by each sketch.



Entire Selection

Jennifer's

Annual Outerwear Closeout

Now 30-75% Off

Coats

a. ____________________

b. ____________________

c. ____________________

d. ____________________

e. ____________________

f. ____________________

g. ____________________

h. ____________________

i. ____________________

j. ____________________

k. ____________________

l. ____________________

m. ____________________

Quantities Limited
Hurry in for the best selection!

Jennifer's
Downtown at 1st & Main

Part 2

Directions: Choose the coat and jacket from the above advertisement that you would most like to purchase for yourself. Write your choices below, and give reasons for your selection.

Coat: ____

____

Jacket: ____

____

Activity 9-4 • Sentence Completion

Directions

The statements below review basic styles of menswear. Complete the items by writing in the word or words that best complete(s) each sentence.

1. A basic style of coat that is single breasted and has full, raglan sleeves is a ______.
☐☐☐☐☐☐☐☐☐

2. Pants worn with a suit are also known as ______.
☐☐☐☐☐☐☐☐

3. A set of garments intended to be worn together, such as a jacket and pants, is a ______.
☐☐☐☐

4. Classifications of men's shirts include work, sport, and ______ shirts.
☐☐☐☐☐

5. Pants usually worn for casual occasions are called ______.
☐☐☐☐☐☐

6. Trousers may have separate, extended, or self-______.
☐☐☐☐☐☐☐☐☐☐

7. Men's suits are available in two or three ______ styles.
☐☐☐☐☐

8. Slacks that have a split waistband and no belt loops and can often be adjusted on the side of the waist are called ______.
☐☐☐☐☐☐☐☐☐☐☐

9. A lightweight, full-length coat generally worn during the fall and spring is a ______.
☐☐☐☐☐☐☐

10. A lightweight, single-breasted sports jacket is a ______.
☐☐☐☐☐☐

11. The part of a jacket that folds back on the chest and forms a continuation of the collar is the ______.
☐☐☐☐☐

12. The type cuff that is folded back and secured by cuff links rather than buttons is a ______ cuff.
☐☐☐☐☐☐

Activity 9-4 • Sentence Completion, cont'd.

13. A ______ jacket is more casual than a jacket worn with a suit.
☐☐☐☐☐☐

14. Button-down, French-style, long-point, standard, and tab are common styles of dress shirt ______.
☐☐☐☐☐☐☐

15. The type of waistband that has belt loops and is designed to be worn with a belt is a ______ waistband.
☐☐☐☐☐☐☐☐

16. A heavy, full-length coat generally worn during cold weather is a(n) ______.
☐☐☐☐☐☐☐☐

17. The type shirt intended to be worn when performing labor requiring physical activity is a ______ shirt.
☐☐☐☐

18. Shirt front styles include the French front and the ______.
☐☐☐■☐☐☐☐☐☐■☐☐☐☐☐

19. A military style, belted raincoat is a ______ coat.
☐☐☐☐☐☐

20. The barrel and French are common styles of ______.
☐☐☐☐☐

Activity 9-5 • Writing

Directions

Unscramble the words in the left column below to review factors to consider when coordinating apparel and accessories. Choose three of the factors and write an explanatory paragraph for each choice that details and illustrates how it influences coordination of apparel and accessories.

1. OOCRL

____

2. XEETTUR

____

3. WHGIET

____

4. DHAN

____

5. EITNDDEN SEU

____

6. IGDESN

____

7. ASMERLTAI

____

Paragraph 1

Paragraph 2

Paragraph 3

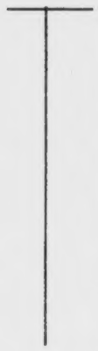
Activity 9-6 • Application

Directions

Clothing for both males and females should compliment and enhance their body figures. From chapter 7 (pg. 100), review guidelines that are used to design, select, construct, an alter apparel that will compliment each customer's figure. In the boxes below, sketch a design or cut and paste a magazine photograph that illustrates each of the following types of lines used in garments. Use the blanks provided beside each box to explain the figure types for which the chosen design is appropriate (i.e., tall, thin, short, heavy).

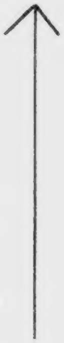
A. **A centered vertical line:**

B. **A T-line**

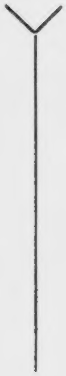


Activity 9-6 • Application, cont'd.

C. **An arrow line**



D. **A Y-line**



Chapter 10

Textile and Apparel Marketing:

Promotion, Public Relations, and Special Fashion Events

Chapter Focus

The following Essential Knowledge and Skills are discussed in Chapter 10.

9A Describe various types of business promotion strategies.

9B Classify types of customers and their motives for buying textile and apparel products.

9C Describe roles of public relations and publicity in product promotion.

9D Explain the use of promotional activities to market textile and apparel products and services.

Introduction

The processes of marketing and merchandising fashion products and services to customers provide many employment opportunities. Examples include careers in fashion communications as a journalist, writer, illustrator, researcher, and advertiser. Careers also are available in public relations, merchandising, and wholesale and retail sales. Knowledge of marketing techniques is essential to enter these employment fields.

Chapter 10 overviews factors that must be considered in marketing, such as market segments, economic considerations, population mix and trends, and sociological factors. Emphasis is given to the promotion and selling of merchandise, which involves advertising, public relations, publicity, special events, and personal selling.

Activity 10-1 • True/False

Directions

Review various considerations involved in marketing products and services to customers by completing the following activity. Read each statement. If the statement is **True**, circle the letter **T** to the left of the statement. If the statement is **False**, circle the letter **F**. If the statement is **False**, rewrite it to make it **True**.

T F 1. Population distribution, age, sex, family life cycle stage, religion, ethnic background, and educational level are examples of demographic characteristics studied by marketers.

____

T F 2. When personal income increases in a society, the purchasing power of consumers is sure to increase.

____

T F 3. Psychographic studies help marketers identify economic traits of customers, such as income and occupation.

____

T F 4. Consumer income is measured only in terms of personal income.

____

T F 5. Disposable income is the total current income received by everyone in the United States in a given year.

____

T F 6. Market segmentation is a process for analyzing the general consumer population as a whole.

____

T F 7. During the last seventy years, the population of the United States has remained about the same.

____

T F 8. During a period of inflation, general price levels of goods and services rise.

____

T F 9. During a recession, unemployment and interest rates are higher than normal, and production is lower than normal.

____

T F 10. Fashion reflects changes occurring in society.

____

T F 11. Persons over sixty-five have little influence on fashion demand because they have little money to spend.

____

T F 12. The largest and fastest-growing population age group in the United States today is teenagers.

____

T F 13. The innovative customer is one who buys a new item in order to be the first to use it.

____

T F 14. The comparison shopper makes a buying decision rapidly without much thought.

____

T F 15. The impulse buyer tends to require complete product satisfaction prior to purchase.

____

T F 16. A follower is a customer who may be influenced to purchase an item upon learning that a respected person or close friend has bought the same product.

____

T F 17. The changing status of women since the early 1900s has accelerated fashion change.

____

T F 18. Ethnic groups in the United States have a profound influence on fashion.

____

T F 19. Increased leisure time has had little to no impact on fashion.

____

T F 20. Asians were the fastest growing ethnic group between 1990 and 1999.

____

Activity 10-2 • Short Answer

Directions

To review the ways in which advertising may be used in fashion promotion, respond to the following questions. Record your answers in the spaces provided.

1. What are two purposes of advertising?

(1) ____________________

(2) ____________________

2. How may advertising agencies and manufacturers assist in advertising?

Advertising agencies: ____________________

Manufacturers: ____________________

3. How do product advertising and institutional advertising differ?

4. What are six common characteristics of successful advertisements?

(1) ____________________

(2) ____________________

(3) ____________________

(4) ____________________

(5) ____________________

(6) ____________________

5. What are the advantages and disadvantages of advertising in newspaper, radio, direct mail, and television? Complete the box below with your responses.

Type of Advertising	Disadvantages	Advantages
A. newspaper		
B. radio		
C. direct mail		
D. television		

Activity 10-3 • Multiple Choice/Case Study

Directions

Part 1

One of each set of two statements below correctly describes how public relations and publicity are used in fashion promotion. Read both statements. Choose the one that is correct, and place a ✔ in the space to the left of your chosen response.

1. _____ (A) The purpose of public relations is to create overall good will for a company.

   _____ (B) The purpose of public relations is to sell featured merchandise immediately.

---

2. _____ (A) A good public relations program focuses on generating a positive image among all employees and internal personnel within a company.

   _____ (B) The purpose of a good public relations programs is to generate a positive image to the community and public.

---

3. _____ (A) The best public relations images are unplanned; they are developed as a natural result of advertising and customer contact by a company over a period of time.

   _____ (B) The best public relations images are intentionally planned; a company carefully considers its desired image and gears advertising and customer policies to develop this image.

---

4. _____ (A) Public relations is the responsibility of the owner and key personnel of a business; employees such as salespersons, delivery persons, or clerks are not involved in public relations.

   _____ (B) All employees within a company, from the delivery person to the owner, are engaged in public relations.

---

5. _____ (A) Although publicity costs a company nothing, the company has not control over the publicity it may or may not receive from the media.

   _____ (B) A company can influence media publicity coverage by investing in programs and personal contacts that are likely to generate positive publicity reports.

---

6. _____ (A) A press release is written by a company and provided to the media to describe upcoming events, new products, and other news that is of public interest.

   _____ (B) A press release is written by a news reporter to describe details about a company's organizational structure.

---

7. _____ (A) Because publicity depends greatly on change, a well-written press release is just as likely to be well publicized by one radio station as by another.

   _____ (B) Because target audiences differ, knowing the target market of a specific radio station and directing a press release to that market will increase the likelihood of good publicity.

8. _____ (A) Because there are so many viewing channels on television, there are more opportunities to receive publicity coverage on television than on radio.

_____ (B) Radio offers better opportunities for publicity coverage of local events than does television.

---

9. _____ (A) Being an active member of community organizations may benefit a key company employee personally, but cannot help the company.

_____ (B) Active participation by key employees in community organizations can benefit a company by promoting public relations and generating publicity.

---

10. _____ (A) Publicity of any kind, whether positive or negative, helps a company because it helps the general public remember the name of a company.

_____ (B) To be of value, publicity should present a positive message consistent with the public relations image which a company has developed.

Directions

Part 2

Read the following case study and answer the questions that follow.

Elyse, who is the assistant to the public relations manager of a retail department store, was assigned to write a press release regarding an upcoming fashion event and give it to the local newspaper. She researched her topic well and wrote an informative, interesting, and well-written release appropriately targeted to the audience. She delivered the release to the front desk at the newspaper office. She was very disappointed when her release was printed in a small space in an obscure section of the newspaper, especially when she saw a competitor's press release that was not as informative or well written given prominent coverage in the fashion section.

A. What possible reasons might you give Elyse to explain why her release received less coverage?

B. What advice would you give Elyse to follow when submitting the next press release?

Directions

Write a paragraph outlining personal selling techniques that contribute to successful marketing of products and services.

Selling Techniques for Successful Marketing

Activity 10-5 • Multiple Choice

Directions

Complete the following activity regarding various types of special events used in marketing fashion products and services. Read each statement and decide what type of special event is discussed. In the blank to the left of each statement, write the letter that identifies the correct event.

D = Demonstration or Educational Event
M = Merchandise Event
T = Trade or Industrial Fashion Show
R = Retail Fashion Show

_____ 1. A specialty store sponsors a public lecture on fashion trends and provides literature on coordinating and accessorizing apparel items.

_____ 2. Customers are invited to this specialty shop's fashion show to view fashion merchandise for the coming season.

_____ 3. Members of the press are invited to a fashion show hosted by a cotton textile producer where items made using a new textile production process are featured.

_____ 4. A July 4th Sale, Washington's Birthday Sale, or Fall Harvest of Values Sale is typical of this event.

_____ 5. A cosmetic department advertises a clinic where customers can use new cosmetics and receive sample products.

_____ 6. A bridal shop holds an in-store show to train employees to sell new merchandise and to generate enthusiasm for the latest fashion.

_____ 7. A fabric store advertises, "Manufacturer's rep will be in the store to demonstrate features of our newest sewing machine during this event."

_____ 8. A department store runs a traditional annual January white sale of linens.

_____ 9. Retailers are invited to view a fashion show sponsored by an apparel manufacturer during Market Week and to place seasonal orders.

_____ 10. A department store teams up with a hospital to sponsor a fashion show to raise money for the Special Olympics.

Chapter 11

Visual Merchandising

Chapter Focus

The following Essential Knowledge and Skills are discussed in Chapter 11:

10A Identify components used in developing displays.

10B Determine ways in which design elements and principles are used in the creation of displays.

10C Describe types and uses of interior and exterior displays.

10D Create window or other displays of textile and apparel products.

Introduction

Visual merchandising attracts customers into stores and departments, stimulates interest and sales, and contributes to the overall image of a business. In a large business, display directors, specialists, assistants, and trimmers may be employed to plan, create, and maintain displays. In small businesses, employees not specifically hired in visual merchandising may be assigned display responsibilities. A general understanding of visual merchandising thus opens employment opportunities in the fashion field.

Chapter 11 overviews components and types of displays. The chapter also describes ways in which elements and principles of design are used in the creation of displays.

Activity 11-1 • Matching

Directions

Use the following exercise to identify jobs available in merchandise display. Place the letter of the job in the blank to the left of the description. Not all terms will be used.

Job

A. Display Assistant
B. Display Director
C. Display Specialist
D. Freelance Display Specialist
E. Owner or Manager
F. Trimmer

Descriptions

_____ 1. An independent who provides display services to business for a fee.

_____ 2. An entry-level employee who assists the display specialist in construction, installation, and maintenance of displays.

_____ 3. A person specifically trained or talented in one area of visual merchandising, such as lighting.

_____ 4. An employee with display experience who may create designs or implement designs of others.

_____ 5. The person responsible for planning and creating all exterior and interior displays.

Activity 11-2 • Sentence Completion

Directions

Review major types of window displays, responsibilities related to window displays, types of windows, and components used in window displays by completing the following activity. Complete the following items by writing in the word or words that best complete(s) each sentence.

Word List

- background
- campaign window
- closed
- decorative
- departmental
- floor covering
- functional
- lighting
- line-of-goods
- mass
- merchandise
- open
- pinpointing
- related
- rotation
- sale
- semi-closed
- series
- single-category
- single-promotion
- structural

1. Items from one manufacturer are featured in a ________________________ display.

2. Displays that promote a major selling event in all or most of a store's windows are known as ________________________ display.

3. Displays that feature a single type of merchandise at one price as called ________________________ displays.

4. Bargain or clearance sale merchandise is featured in ________________________ displays.

5. The same type of merchandise is featured in the same windows for several weeks in a ________________________ display.

6. A large variety of low-priced items are combined in a ________________________ display.

7. Window assignments are alternated from one department to another in the ________________________ method of assigning display responsibilities.

8. Certain windows are assigned to certain areas of the store in the ________________________ method of assigning display responsibilities.

9. The window that does not allow customers to view the inside of the store is referred to as a ________________________ window.

10. Windows that allow customers to see inside the store from the outside are called ________________________ windows.

Activity 11-2 • Sentence Completion, cont'd.

11. The ______________________________ window has a partial background that hides some of the store interior from persons looking in the window.

12. The central focus of any display is the ______________________________.

13. Directing the customer's attention to the display and highlighting merchandise features is accomplished through the use of display ______________________________.

14. Items such as boxes, stands, and cylinders that support functional and decorative props are called ______________________________ props.

15. A good display will blend the fiberboard, fabric, or wallboard ______________________________ in with the rest of the display.

16. Props used to establish a mood or setting for the merchandise being displayed are called ______________________________ props.

17. Mannequins, jewelry forms, screens, and stands are examples of ______________________________ props.

18. Materials, such as cork chips, carpet, rocks, and mats, may be used as ______________________________ in a display.

19. Displays in which several adjoining windows are used to display a common merchandise theme are ______________________________ displays.

20. Displays in which various classifications of related merchandise are arranged in one window are ______________________________ displays.

Activity 11-3 • True/False

Directions

Read each statement about the major types of interior displays and their uses. If the statement is **True**, circle the letter **T** to the left of the statement. If the statement is **False**, circle the letter **F**. If the statement is **False**, rewrite it to make it **True**.

T F 1. A shadow box is open on only one side and is especially appropriate for expensive items like jewelry.

____

T F 2. Clothing on full-size mannequins is typically displayed on platforms.

____

T F 3. Arranging merchandise on top of glass selling counters helps to draw attention to items within the glass display case.

____

T F 4. Environment displays usually contain one item in a blank open space.

____

T F 5. A video kiosk is a self-selection display designed so that customers can see merchandise in a moving format.

____

T F 6. Counter displays are designed to help customers select merchandise without assistance.

____

T F 7. Walls and ledge space are often used for gondolas.

____

T F 8. Displays suspended from the ceiling or other support are called hanging displays.

____

Activity 11-3 • True/False, cont'd.

T F 9. A large number of hanging displays are appealing to the eye.

T F 10. One type of island display unit is an aisle display.

Activity 11-4 • Short Answer

Directions

Analyze ways in which design elements are used in the creation of displays by responding to the following items. Record your answers on the blanks provided.

1. Describe two uses of the element of line in displays.

(1) ______________________________

(2) ______________________________

2. Cite five examples of impressions formed by using different types of lines.

(1) ______________________________

(2) ______________________________

(3) ______________________________

(4) ______________________________

(5) ______________________________

3. State two important guidelines related to shapes used in displays.

(1) ______________________________

(2) ______________________________

4. List two uses of color in displays.

(1) ______________________________

(2) ______________________________

5. Cite examples of impressions created by four specific colors.

Color #1 ______________________________

Color #2 ______________________________

Color #3 ______________________________

Color #4 ______________________________

6. Explain how space is considered in designing a display.

7. Explain how size is considered in design a display.

8. Give an example of the use of texture in displaying merchandise.

Activity 11-5 • Matching

Directions

Complete the following activity to determine ways in which design principles are used in the creation of displays. Read each statement below and decide which design principle listed is best illustrated by the statement. In the blank to the left of each statement, write the letter that identifies the correct principle. Each principle may be used more than once.

B = Balance
E = Emphasis
H = Harmony
P = Proportion
R = Rhythm

_____ 1. The intended idea of an effective display is clear with no parts of the display overdone.

_____ 2. Several duplicate items may be repeated in a display to achieve this principle.

_____ 3. Parts of an effective display are arranged to create a feeling of equilibrium.

_____ 4. This principle, also called dominance, is achieved by drawing attention to a certain part of a display design.

_____ 5. All parts of a display should be planned so that an impression of oneness or completeness is created.

_____ 6. An interesting, casual display may be achieved by differing items on each side of the design center while maintaining a feeling of equal weight.

_____ 7. One suggestion for applying this principle is to begin by visualizing the vertical space of the display in thirds.

_____ 8. Different sized items may be alternated to create this design principle.

_____ 9. An effective display has a focal point or center of interest.

_____ 10. Props should not be too large or too small in relation to the merchandise displayed.

Activity 11-6 • Research

Directions

In the left column below, list five common display arrangements. In the space to the right of each display arrangement, give an example or briefly describe the display arrangement.

Display Arrangement	Example/Description
1.	
2.	
3.	
4.	
5.	

Activity 11-7 • Short Answers

Directions

In the space below, list five ways signage is used in retail stores.

1. ____
2. ____
3. ____
4. ____
5. ____

Activity 11-8 • Application

Directions

Listed below are types of fixtures that are used in displays. In the space to the right of each item, provide an example of how that fixture can be used to support and display merchandise.

Type of Fixture	**Example of Use**
1. Forms	
2. Garment top	
3. Lingerie top	
4. Platforms	
5. Set-pieces	
6. Tent costumer	
7. Tri-rack	
8. T-stand	
9. T-top	
10. Waterfall brackets	

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Chapter 12

Selection of Fabrics and Notions for Garment Design

Chapter Focus

The following Essential Knowledge and Skills are discussed in Chapter 12:

4B Outline general procedures and equipment used in apparel design and pattern development.

4C Analyze factors to consider when selecting fabrics for garment design and production.

Introduction

Fabrics are important components of a variety of products. Fabric selection is especially important when designing and constructing apparel. Notions are also important components of apparel design. Since the entire look of a garment results from all of its components, fabric and notions are important influences on each garment. Fabrics and notions are chosen based on fashion trends, quality, performance, price, and suitability. Chapter 12 will help individuals select fabric and notions appropriate for garment design.

Activity 12-1 • Writing

Directions

Analyze factors to consider when selecting fabrics for apparel construction including grain, weight, and hand of fabrics by completing the following activity. Using at least ten words from the list below, write a paragraph explaining the process to be followed when selecting fabric for a garment design.

Word List

bottom-weight fabrics
fabric performance
fabrication
grain
hand
heavyweight fabrics
medium-weight fabrics
ounces per square yard
ounces per yard
relatively lightweight fabric
top-weight fabrics
very heavyweight fabrics
weight
yards per pound

Activity 12-2 • True/False

Directions

Review factors to consider when selecting patterned, printed, napped, sueded, and pile fabrics by completing the following activity. Read each statement. If the statement is **True**, circle the letter **T** to the left of the statement. If the statement is **False**, circle the letter **F**. If the statement is **False**, rewrite it to make it **True**.

T F 1. The repeat of a print is the amount of fabric necessary for a floral or geometric pattern to duplicate itself totally.

____

T F 2. A complicated garment design with many seams and other details would not be suitable for fabric with a large pattern.

____

T F 3. When napped fabric is used in garment design, the placement of the pattern on the fabric does not make a difference.

____

T F 4. Fabrics intended for apparel use are usually napped on one side only.

____

T F 5. A one-way print is a fabric that has printed or woven pattern near the edge of the fabric.

____

T F 6. One of the costs in producing garments includes matching of large plaids and irregular stripes.

____

T F. 7. Pile fabrics where loops remain uncut include corduroy and velveteen.

____

T F 8. Gigging is a term used to describe the sueding process.

____

Activity 12-2 • True/False, cont'd.

T F 9. Sueded fabrics are the most comfortable in cool or cold weather because the loose fiber ends trap air to serve as insulation.

T F 10. If a garment design includes important structural lines and details, it is important that an intricate fabric be selected as the focal point of the garment.

Activity 12-3 • Sentence Completion

Directions

The statements below review how shaping fabrics are used in construction of apparel. Complete the items by writing in the word or words that best complete(s) each statement. Each word may be used once, more than once, or not at all.

Word List

- design
- fashion fabric
- fusible interfacing
- interfacing
- interlining
- lining
- shaping fabrics
- underlining

1. ______________________ fabrics are usually smooth, durable, and lightweight enough that they do not interfere with the hang of the garment.

2. A shaping fabric used along garment edges, collars, and cuffs that can be light, medium, or heavy in weight is called ______________________.

3. Shaping fabrics must be compatible with the ______________________, the fabric from which the garment is constructed.

4. Fabric that is used to add shape and warmth to coats and jackets is called ______________________.

5. Rigidity can be added to the garment fabric by ironing on ______________________.

6. During garment construction, one piece of the garment fabric and one piece of the ______________________ fabric are placed together and treated as one.

7. Interfacing, lining, underlining, and interlining are all types of ______________________.

8. Pile fabrics, quilted fabrics, and satin-backed, insulated fabrics are sometimes used for ______________________ in order to add warmth.

9. To add shape, crease-resistance, and wear to a garment, ______________________ is used.

10. The fabric that is cut in the shape of a lining section and placed between the lining and the garment fabric is called ______________________.

Activity 12-4 • Math

Directions

Practice estimating yardage by answering the questions below. Read each situation carefully and calculate the estimated yardage needed by each individual. Record your answer in the space provided. Refer to Table 12.1 on page 176 of the Reference Book to look up fabric width conversions.

1. D'Aunn want to make a dress. The pattern she has selected gives the yardage for 44/45" wide fabric. D'Aunn will need 3 5/8 yards of fabric if the fabric is 44/45" wide. However, the fabric she has chosen is 60" wide. How much fabric will D'Aunn need to purchase?
   ____________________ yards

2. Michelle would like to make a skirt and a blouse from the same fabric. The blouse requires 2 3/4 yards and the skirt requires 1 1/2 yards. How many total yards will be needed to complete this outfit?
   ____________________ yards

3. Jake wants to make a gym bag. The denim has selected is 60" wide. The pattern recommends 1 7/8 yards of 32" wide fabric. How much of the 60" wide denim should Jake purchase?
   ____________________ yards

4. Kendra would like to make a widely flared skirt out of corduroy fabric. She knows that the flared skirt will require an additional 1/4 yard of fabric for each yard indicated on the pattern since the fabric has a nap. Her pattern suggests 2 3/4 yards of 44/45" wide fabric. Kendra has selected fabric that is 60" wide. How much should Kendra purchase?
   ____________________ yards

5. Letitia is buying material to make a 3-piece summer shorts set. The Hawaiian print that she has chosen has a large motif that repeats every 9 inches. The pattern calls for 4 yards of 45" wide fabric. How much total yardage should Letitia buy?
   ____________________ yards

Activity 12-5 • Sentence Completion

Directions

Unscramble the words in the following sentences to identify notions used in apparel construction. Refer to Table 12.2 on pages 178-187 of the reference book for assistance.

1. ______________________ A type of button that has a solid top and is sewn on to thick fabrics is called a(n) ASNHK.

2. ______________________ A(n) OIBALTNLP sewing machine needle can be easily used on knit and elastic fabrics.

3. ______________________ A(n) NISIELVIB zipper is hidden in the seam of a garment.

4. ______________________ A(n) ROGF is a decorative closing made of braid with a Chinese ball button.

5. ______________________ A type of thread that is placed on the bobbin only of a sewing machine and used for gathering or shirring is called TISACLE thread.

6. ______________________ The straight pin that has a glass or plastic ball on one end and is recommended for general use is called a(n) RELGA ADEH.

7. ______________________ A shiny nylon thread used for decorative hand or machine stitching is called CTEMLIAL thread.

8. ______________________ A fastener used on skirts or pants that has a special design to keep the hook from slipping off the eye is called a(n) ISTANAWDB.

9. ______________________ A(n) NIELELHC is a hand needle that ranges in sizes 13 to 26 and is used in embroidery work with yarn.

10. ______________________ A fastener used on decorative tabs, straps, and belts is a(n) UCEKLB.

11. ______________________ When hand sewing with leather, fur, vinyl, or plastic, a(n) OEVRLG needle should be used.

12. ______________________ A heavy silk or rayon ribbon with narrow horizontal ribs is called OSAIGRGRN.

13. ______________________ An openwork cloth with a design formed by a network of threads primarily used for decorative edging is called EACL.

Activity 12-5 • Sentence Completion, cont'd.

14. ______________________ A(n) MAKRSIEAL is a hand needle used with heavy leather and canvas that has a triangular point extending part way up the shank.

15. ______________________ Small shiny disks that are sewn on to garments in decorative designs are QNSSEUI.

16. ______________________ SMEALDOLIN are attached to form a chain and can be cut apart and used as appliqués.

17. ______________________ A shaping aid made of flexible nylon that is applied to garments when maintaining and molding shape is required is NIOGNB.

18. ______________________ Braided elastics have more gripping power than VEOWN elastics.

19. ______________________ For general machine sewing a(n) IUDMME needle is best.

20. ______________________ When sewing with knits and elastics, the best straight pin to use is a(n) LIAPTNBLO.

Chapter 13

Sewing and Repairing Techniques

Chapter Focus

The following Essential Knowledge and Skills are discussed in Chapter 13:

5D Differentiate procedures and techniques appropriate for varied production systems to achieve quality apparel products.

5E Utilize established production procedures and processes to achieve quality standards in finished products.

6F Utilize appropriate techniques and processes to alter, repair, and customize textile and apparel products according to quality standards.

Introduction

Employees apply sewing and repairing techniques in apparel manufacturing settings, custom sewing businesses, and alterations and mending businesses and departments. Experience and skill in sewing and repairing helps one gain employment in the textile and apparel industries. Chapter 13 provides suggestions for time management techniques, describes the major steps involved in the sewing process, applies basic sewing techniques, and identifies garment repair techniques used in the construction and care of apparel.

Activity 13-1 • Writing

Directions

Explain how the principles of managing time, energy, motions, and work can be applied to sewing, repairing, and pressing tasks by completing the following activity. Write a paragraph explaining how good work habits can be enhanced by applying these principles.

Improving Work Habits Through Motion Economy Techniques

Activity 13-2 • Sentence Completion

Directions

The statements below review steps involved in the sewing process in the textile and apparel industries. Complete the following items by writing in the word or words that best complete(s) each sentence. Not all words will be used.

Word List

composite garments
draped garments
fit
fitted garment
foot control
garment construction
garment repair
machine control
seam
stitch
tailored garment
threading

1. The ability to feed materials through the machine evenly is one aspect of ______________________________.

2. A ______________________________ joins two or more plies of fabric together.

3. The process of joining smaller garment pieces together into larger units is known as ______________________________.

4. ______________________________ are made by cutting garment pieces and sewing them together to fit the shape of the body.

5. When a garment is the right size and does not pull tightly or sag loosely, it is considered to be a good ______________________________.

6. The formation of thread used to make a seam is called a(n) ______________________________.

7. Resewing seams, reattaching fasteners, and patching holes to return a garment to a usable condition are some of the components involved in ______________________________.

8. Garments made by combining the tailored and draped methods are called ______________________________.

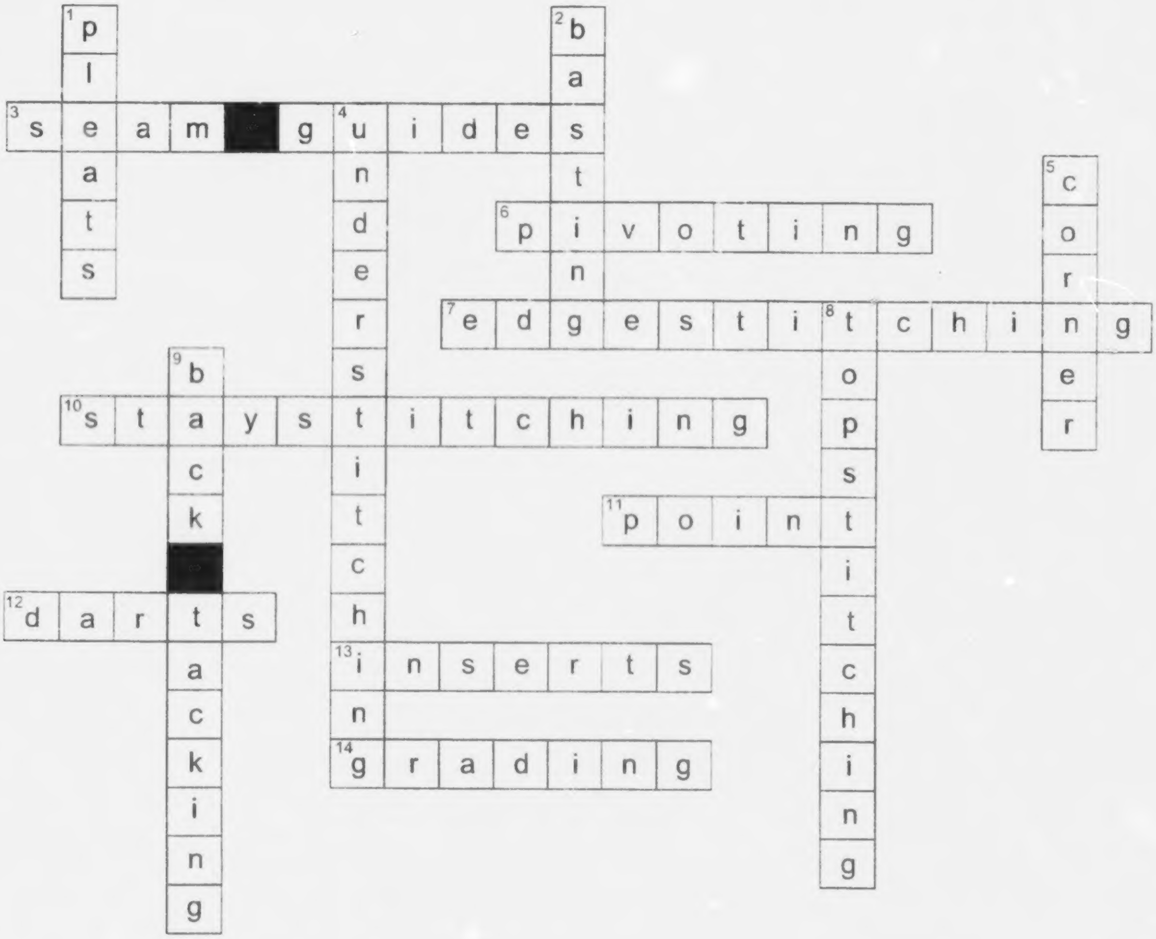
9. A garment shaped so that it follows the lines of the body is a(n) ______________________________.

10. Garments that are wrapped or hung on the body are called ______________________________.

Activity 13-3 • Puzzle

Directions

The following crossword puzzle has the answers already filled in, but the clues are missing. Down the left side of a separate sheet of notebook paper, list the numbers printed below under Across and Down. Beside each number, write a clue for each answer. Accurate clues will summarize knowledge of basic sewing techniques.



Across

3.
6.
7.
10.
11.
12.
13.
14.

Down

1.
2.
4.
5.
8.
9.

Activity 13-4 • Multiple Choice

Directions

Complete the following multiple choice activity to identify methods for producing various types of seams and seam finishes. In the blank to the left of each item, place the letter of the response that best completes the statement.

_____ 1. When the plies of fabric come out the same length with edges even, sewn to the required width, and no puckers a(n) _____ has been sewn.

A. eased seam
B. welt seam
C. straight seam
D. French seam

_____ 2. A method of cutting out V-shaped pieces from a seam allowance on an outside curve so that the seam will lie flat when the garment is turned right side out is called _____.

A. clipping
B. notching
C. grading
D. trimming

_____ 3. Cutting away a part of the seam allowance to reduce bulk is called _____.

A. trimming
B. clipping
C. notching
D. grading

_____ 4. One of the steps included in the preparation of a clean finished seam is _____.

A. turning the seam allowance under 1/8" or 1/4" if the fabric ravels easily
B. applying a series of alternating angled stitches to the raw edges of a seam allowance
C. trimming the edge of the seam with pinking shears
D. trimming the seam allowances close to the raw fabric edge

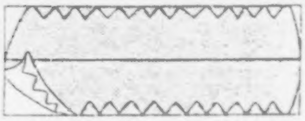
_____ 5. One of the steps included in the preparation of a hand-overcoat seam finish is _____.

A. turning the seam allowance under 1/8" or 1/4" if the fabric ravels easily
B. applying a series of alternating angled stitches to the raw edges of a seam allowance
C. trimming the edge of the seam with pinking shears
D. using a single thread to make slanted stitches at the edge of each seam allowance

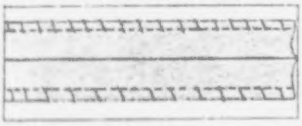
Activity 13-5 • Identification

Directions

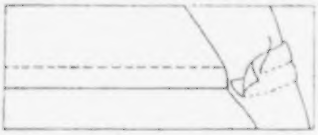
Complete the following activity to identify basic seams, seam finishes, and hand stitiches. In the blank below each picture, write the name of the pictured seam, seam finish, or hand stitich.



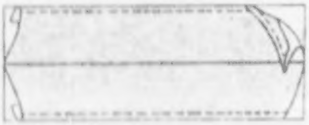
1. ______________________



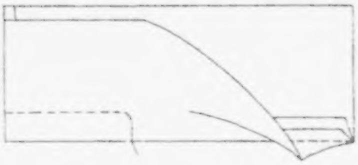
2. ______________________



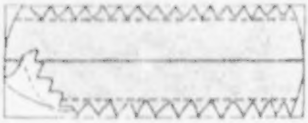
3. ______________________



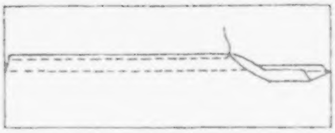
4. ______________________



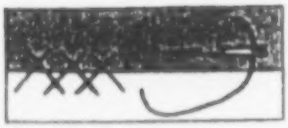
5. ______________________



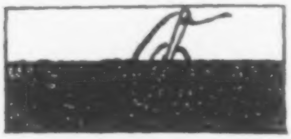
6. ______________________



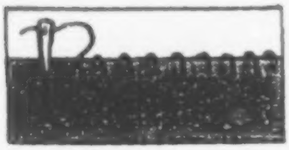
7. ______________________



8. ______________________



9. ______________________



10. ______________________

Activity 13-6 • Sentence Completion

Directions

Apply your knowledge of various hand stitches used in apparel construction by completing the following sentences. Supply the missing letters for the most appropriate word(s) to complete each sentence. Write the answers in the boxes below each sentence.

1. Stitches that hold two garment sections together while keeping both sections loose are called _____.

☐☐☐☐☐☐■☐☐☐☐☐

2. The _____ is used to secure hand stitching at the beginning and end of a seam.

☐☐☐☐☐☐☐☐☐☐

3. A stitch used to decorate garments, patch garments, and make hand-stitched bar tacks is a _____ stitch.

☐☐☐☐☐☐☐

4. The _____ stitch is used to temporarily hold fabric layers together during fitting and construction until the layers can be permanently sewn.

☐☐☐☐☐☐☐

5. A _____ stitch is used for seaming, tucking, mending, gathering, and other delicate sewing work.

☐☐☐☐☐☐☐

6. A stitch that can be used to make belt carriers and loops for buttons is a _____.

☐☐☐☐☐☐■☐☐☐☐☐

7. Stitches that are permanent yet look like temporary diagonal basting stitches are called _____ stitches.

☐☐☐☐☐☐☐

8. A ____ is used for hemming, tacking facings, attaching patch pockets, finishing waistbands, attaching trims, and attaching jacket linings.

☐☐☐☐☐☐☐☐☐☐

9. The _____ stitch finishes the raw edges of seams or fabric to prevent raveling.

☐☐☐☐☐☐☐☐

Activity 13-6 • Sentence Completion, cont'd.

10. Stitches often used in alteration and repair of garments are _____ stitches.

☐☐☐☐

11. The flat _____ is primarily used when hemming medium-weight to heavyweight knitted or woven fabric.

☐☐☐☐☐☐☐☐☐☐☐

12. The ____ is made between the hem and garment fabric and should be invisible on both the hem edge and the outside of the garment.

☐☐☐☐☐■☐☐☐☐☐☐☐☐☐☐☐

13. The _____ stitch is used as a decorative finish, to make handmade buttonholes, and to attach snaps, hooks, and eyes.

☐☐☐☐☐☐☐☐☐☐

14. The stitches used to transfer pattern markings and construction details onto fabric garment pieces are _____.

☐☐☐☐☐☐☐■☐☐☐☐☐

15. The ____ stitch is suitable for hems finished with seam tape.

☐☐☐☐☐☐☐☐■☐☐☐☐☐☐☐

Activity 13-7 • True/False

Directions

Demonstrate your knowledge of garment repair techniques by completing the following activity. Read each statement. If the statement is **True**, circle the letter **T** to the left of the statement. If the statement is **False**, circle the letter **F**. If the statement is **False**, rewrite the statement to make it **True**.

T F 1. Repairing ripped seams is one of the most common mending tasks.

____

T F 2. Darning is a method of repairing a hole or tear by following the grain line and by anchoring new yarns in the fabric on all sides of the hole or rip.

____

T F 3. An appliqué can serve as both a trim and a patch.

____

T F 4. A matchstick can be used to make a shank.

____

T F 5. To repair worn buttonholes, leave the previous stitching in place and use as a guide for the new buttonhole stitches.

____

T F 6. The lock stitch that is sewn by hand is similar to a machine basting stitch.

____

T F 7. The final step in darning is steam pressing the finished darn on the right side of the fabric.

____

T F 8. When altering the waistline of a garment, it is often necessary to remove a zipper and reinsert it.

____

Activity 13-7 • True/False, cont'd.

T F 9. The chain-constructed zipper is a continuous strand of nylon or polyester twisted into a spiral and attached to a tape made of manufactured fiber(s).

____

T F 10. The fly front opening usually laps from right to left in women's pants and laps from left to right in men's pants.

____

T F 11. A seam pocket is a pocket sewn into the side seam or the side front seam of a garment.

____

T F 12. If replacing a half pocket in a garment, use a regular straight seam to attach the new half pocket to the top half of the original pocket.

____

T F 13. The backstitch stitch is used to fasten snaps, hooks, and eyes to a garment.

____

T F 14. When making repairs, use thread a shade darker than the fabric shade for good blending.

____

T F 15. Mercerization is a chemical bath applied to nylon threads to give greater strength, more luster, and a smoother surface.

____

T F 16. Use twill or bias tape to reinforce armseye seams, necklines, plackets, and vents.

____

T F 17. The darning process is used on all sized holes, from small to large.

____

T F 18. Darning is performed on the wrong side of the fabric.

____

T F 19. Fusible interfacing fabric can be used as an underlay fabric (reinforcing fabric) on a damaged garment area.

____

T F 20. Measurements used in directions for inserting zippers refer to the length of the zipper tape.

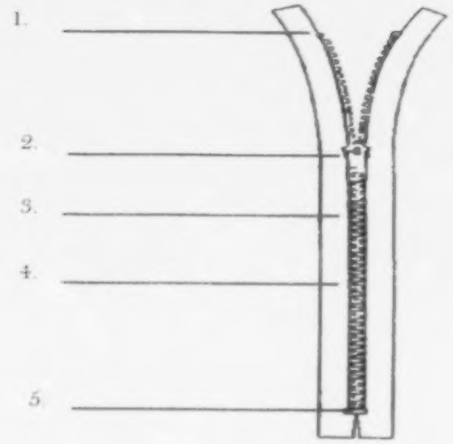
____

Activity 13-8 • Identification/Definition

Directions

Part 1

Label the parts of the zipper illustrated below. Use the blanks provided to record your answers.



Part 2

Define the following terms.

1. Coil-constructed zipper ____________

2. Overlap ____________

3. Placket ____________

4. Chain-constructed zipper ____________

5. Underlap ____________

Chapter 14

Use and Care of Sewing Equipment

Chapter Focus

The following Essential Knowledge and Skills are discussed in Chapter 14:

5A Describe types, uses, and care of equipment, tools, and supplies used in apparel production.

6D Describe types, uses, and care of tools, equipment, and supplies used to alter, repair, and customize textile and apparel products.

Introduction

A variety of expensive machines, tools, and equipment are used by manufacturers, custom sewers, dressmakers, tailors, and alterationists. An employee in the apparel industry needs to be familiar with functions of various equipment and know how to operate and care for sewing equipment.

Chapter 14 identifies and describes sewing machines and attachments, as well as equipment for marking, cutting, and sewing. It also describes the functions, use, and care of these tools. Information on both conventional and industrial equipment is included.

Activity 14-1 • Sentence Completion

Directions

Review types and uses of conventional sewing machines by completing the following activity. Read each statement and write the missing words in the spaces provided.

Types of Conventional Sewing Machines

1. The __ __ __ __ __ __ __ __   __ __ __ __ __ __ sewing machine feeds fabric forward and backward to stitch straight lines.

2. No special attachments are needed on the __ __ __ __ __ __ sewing machine to make both straight and zigzag stitches.

3. The __ __ __ __ __ __ __ __ __   __ __ __ __ __ __ sewing machine has built in pattern cams which allow straight, stretch, chain, zigzag, and decorative stitching.

4. __ __ __ __ __ __ __ __ __ __ sewing machines perform all of the above stitches and are equipped with programmable computer electronics.

5. __ __ __ __ __ __ __ __ __ __ __ __ sewing machines are designed for use by home sewers or people in the business of custom sewing, alterations, or designing.

Forming Stitches

6. The upper thread interlocks with the lower thread on a sewing machine to form __ __ __ __ __ __ __ __.

7. The lower thread in a stitch comes from a small metal or plastic cylinder called the __ __ __ __ __ __, which is located in the lower part of the machine.

8. The __ __ __ __ __ __ __   __ __ __ __ catches the thread loop and carries it around and under the bobbin case during the stitching process.

9. The __ __ __ __ __ __   __ __ __ __ __ has openings for the needle to pass through and for the feed to move up and down.

10. The needle plate has etched lines at several widths from the needle that serve as __ __ __ __   __ __ __ __ __ __.

Adjusting Tension

11. Tension on the needle thread and the __ __ __ __ __ __ thread must be balanced to make perfect stitches.

12. The small hooks on a sewing machine that hold and guide the thread from the spool to the needle are called __ __ __ __ __ __ __ __ __ __ __ __.

13. In threading the machine, thread is placed between two __ __ __ __ __ __ __ __ __ __ __ __, which apply pressure to regulate the thread's flow.

14. Tension on the top thread (needle thread) is adjusted by turning the __ __ __ __ __ __ __ __ __ __ __.

15. Tension on the bottom thread (bobbin thread) is adjusted by very slightly turning an adjustment screw on the __ __ __ __ __ __ __ __ __ __.

Adjusting Stitches

16. The length and direction of the stitch are determined by the __ __ __ __ __ __ __ __ __ __ __ __ __ __ __ or stitch length control.

17. Adjusting the stitch regulator changes the distance the __ __ __ __ advances the fabric for each stitch.

18. The amount of downward pressure placed on the fabric by the presser foot is regulated by the __ __ __ __ __ __ __ __ __ __ __ __ __ __ __ __ __.

19. The width of zigzag stitches is set by the __ __ __ __ __ __ __ __ __ __ __ control.

20. The __ __ __ __ __ __ __ __ __ __ __ __ __ __ __ is used to move the needle from left to center to right.

Using Sewing Machine Needles

21. Five basic types of sewing machine needles are __ __ __ __ __, __ __ __ __ __ __ __ __ __, wedge-shaped, __ __ __ __, and __ __ __ __ __ __.

Activity 14-1 • Sentence Completion, cont'd.

Using Sewing Machine Needles, cont'd.

22. The type and size of sewing machine needles are determined by the fabric type and __ __ __ __ __ __.

23. When inserting a sewing machine needle into the needle bar, the __ __ __ __ __ __ __ side should face the direction from which the needle is threaded.

Threading The Machine

24. When threading a sewing machine, the __ __ __ __ __ __ __   __ __ __ __ should be raised to allow the thread to move easily through the tension discs.

25. The location of the last __ __ __ __ __ __   __ __ __ __ __ indicates which direction to thread the needle.

26. Poor stitching is often caused by incorrect __ __ __ __ __ __ __ __ __.

Preparing the Bobbin

27. The __ __ __ __ __ __ __   __ __ __ __ __ __ winds thread from the spool onto the bobbin.

28. After the thread is wound onto the bobbin, the bobbin is placed inside a __ __ __ __ __ __   __ __ __ __ in the lower part of the machine.

29. The wheel that controls the movement of the take-up lever on a sewing machine is the __ __ __ __ __ __ __ __ __.

30. The stop motion screw located on the handwheel is also called the __ __ __ __ __ __ __ __.

Activity 14-2 • Research

Directions

Respond to the following items to explain types and uses of industrial sewing machines. Use complete sentences to answer in the spaces provided.

1. How do industrial sewing machines differ from conventional machines?

2. How can you tell if a stitch was formed by a lock or a chain stitch machine?

3. Describe the three types of lock stitch machines and their uses.

4. Describe six types of chain stitch machines and their uses.

5. The following automatic machines are used to complete specific tasks. Name tasks which may be performed by each machine:
   - lock stitch tacker
   - buttonhole machine
   - button sewer
   - decorative stitch machine

6. While industrial sewing machines are similar in many ways to conventional machines, they contain some unique parts which perform specific tasks. Explain the task of each industrial machine part listed:
   - table
   - motor
   - treadle
   - knee press
   - balance wheel or machine driving pulley
   - belt
   - thread stand
   - sewing lamp

7. List the two types of industrial machine beds, and give examples of types of each bed.

Activity 14-3 • Matching

Directions

Part 1

Match the sewing machine attachment with its description. Place the letter of the sewing machine attachment in the blank to the left of the description. Each letter may be used once, more than once, or not at all.

Terms

A. Binder
B. Butterfly gauge
C. Button foot
D. Cording and welting attachment
E. Double-margin gauge
F. Embroidery foot
G. Fabric trimmer attachment
H. Folder
I. Gathering foot
J. Hemmer
K. Knife attachment
L. Lapped seam attachment
M. Rotary pinker
N. Pleating attachment
O. Ruffler attachment
P. Single-setting gauge
Q. Straight stitch foot
R. Thread cutter
S. Zigzag foot
T. Zipper foot

Descriptions

_____ 1. Also called a multi-margin gauge; sews items with both straight and curved edges to produce seams of correct widths

_____ 2. Pinks seams as they are sewn

_____ 3. Folds a series of pleats for stitching

_____ 4. Ordinary presser foot used for single-needle, straight stitching

_____ 5. Sews double-lapped seams on men's shirts, trousers, and women's blouses

_____ 6. Stitches any seam that has more bulk on one side than on the other

_____ 7. Positions fabric and binding so they can be fed under the needle and stitched together

_____ 8. Performs tasks such as setting in sleeves by drawing a specific amount of fabric into a smaller area by stitching

Activity 14-3 • Matching, cont'd.

_____ 9. Automatically feeds rolls of cord or tape between two plies of fabric, and sews the cord or tape into the seam as it is stitched

_____ 10. Folds fabric into the desired seam shape before it is fed under the needle; handles more than one ply of fabric

_____ 11. Fold or rolls the edge of fabric automatically to form a hem

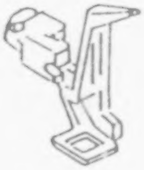
_____ 12. Cuts between two rows of stitching, such as buttonholes

_____ 13. Holds a button in place to be stitched by machine

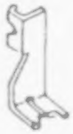
Part 2

Match the sewing machine attachment with the correct illustration. Place the letter of the sewing machine attachment in the blank to the left of the illustration.

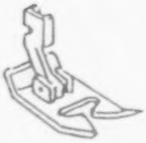
_____ 14.



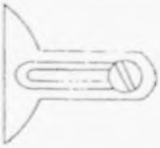
_____ 15.



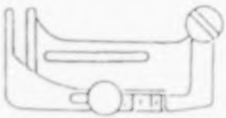
_____ 16.



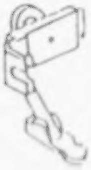
_____ 17.



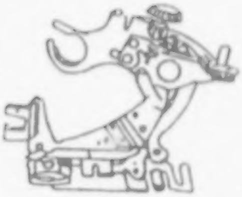
_____ 18.



_____ 19.



_____ 20.



Directions

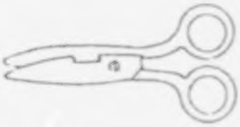
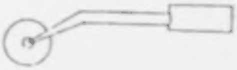
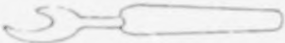
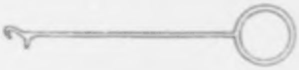
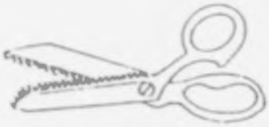
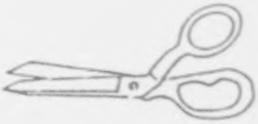
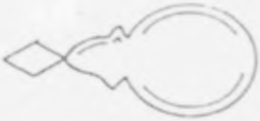
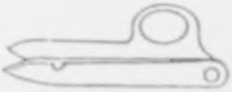
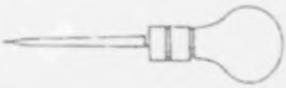
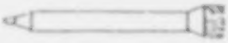
Analyze common problems that occur when using sewing machines by filling the following chart. Read each statement describing a situation that may cause a problem. Determine the possible problem(s) that may result if the situation is not corrected. Write answers in the space provided under Potential Problems.

Situation	Potential Problems
1. Fabric lint collects around the bobbin area and the needle bar	
2. Oil level gets too low	
3. Excess oil is left after oiling the machine	
4. Top thread tension adjustment is too tight	
5. Bottom tension is too tight	
6. Wrong size needle is used	
7. Bobbin case is loose	
8. Too much pressure on presser foot	
9. Machine not threaded properly	
10. Blunt or damaged needle used	

Activity 14-5 • Identification

Directions

Complete the following activity to identify miscellaneous sewing equipment and tools and their functions. In the blank to the right of each sketch, write the name of the equipment item. In the box with each sketch, briefly describe the item's functions.

1. ____________________ 	2. ____________________ 
3. ____________________ 	4. ____________________ 
5. ____________________ 	6. ____________________ 
7. ____________________ 	8. ____________________ 
9. ____________________ 	10. ____________________ 

Activity 14-6 • Sentence Completion

Directions

Review your knowledge of miscellaneous sewing equipment and tools by completing the following exercise. From the word list below, select the response that *best* completes each sentence. Record your answer in the blanks provided.

Word List

- basting
- bodkin
- drill holes
- emery bag
- laser cutting
- needle threader
- pin cushions
- plumb line
- pointer and creaser
- position marking
- self-sticking sewing tape
- spreading machine
- straight pins
- tailor's chalk
- tailor's wax
- thread markings
- tissue paper
- transparent tape
- tweezers
- vertical knife cutting

1. The machine with a carriage that moves up and down a table to unroll layers of fabric into a stack for cutting is a(n) ______________________________.

2. A common cutting method in which an electric blade rapidly moves up and down to cut plies of fabric is called ______________________________.

3. A process where carbon dioxide gas severs the plies of fabric and even fuses the edges of some fabric type is called ______________________________.

4. A marking technique in which tiny slashes are cut in garment pieces to mark locations of construction details is called ______________________________.

5. Small holes that may be created in fabric by automated cutting systems to position darts, pockets, and plackets are called ______________________________.

6. A clay based chalk material used to mark fabrics is called ______________________________

7. A tool made from white or colored wax and used primarily to mark wool garments is called ______________________________.

8. A hand needle and sewing thread are used to make tailor's tacks and hand basting, which are two types of ______________________________.

9. Ballpoints, large heads, T-shaped heads, and flat heads are all example of ______________________________.

10. A small cushion stuffed with granulated material for cleaning and sharpening pins and hand sewing needles is a(n) ______________________________.

11. ______________________________ may be used to remove tailor's tacks, gathering threads, basting threads, and threads or knots that accumulate in a sewing machine.

12. A blunt, needle-like tool used to pull material or elastic through a casing is a(n) ______________________________.

13. A heavy cord with a metal weight tied to one end used to check center front, center back, and side seam locations is a(n) ______________________________.

14. ______________________________ is a thin flexible paper that may be used to make pattern alterations or transfer monograms and designs.

15. ______________________________ is a special tape with measured markings on one side that are especially helpful when topstitching.

16. A diamond-shaped loop of flexible, fine wire attached to a small flat metal or plastic plate is a(n) ______________________________.

17. ______________________________ can be used to hold a zipper in place for topstitching.

18. ______________________________ are firmly stuffed pillows attached to a clip that may be held on the wrist for convenience.

19. A temporary stitching technique used for various purposes including marking fabrics is called ______________________________.

20. ______________________________ is a flat tool with a pointed end for pushing out corners and a rounded end used to flatten seam lines.

Chapter 15

Pressing Techniques and Equipment

Chapter Focus

The following Essential Knowledge and Skills are discussed in Chapter 15:

5A Describe types, uses, and care of equipment, tools, and supplies used in apparel production.

5E Utilize established production procedures and processes to achieve quality standards in finished products.

7E Demonstrate proper selection, use, and care of equipment and products for cleaning, laundry, and pressing tasks.

Introduction

Employees apply pressing techniques in various settings within the textile and apparel industries. Pressing techniques are used in apparel manufacturing, custom sewing, alteration and mending, and laundry and dry cleaning operations.

Chapter 15 covers basic techniques that are applicable to any setting. Special emphasis is given to pressing techniques used during apparel construction and in laundry and dry cleaning.

Activity 15-1 • True/False

Directions

Complete the following activity to review pressing techniques and pressing equipment. Read each statement. If the statement is **True**, circle the letter **T** to the left of the statement. If the statement is **False**, circle the letter **F**. If the statement is **False**, rewrite it to make it **True**.

T F 1. Correct pressing and ironing procedures are intended to preserve the original texture and finish of the fabric.

____

T F 2. Pressing is a sliding action in which a heated iron is moved back and forth over fabric to smooth wrinkles.

____

T F 3. Basic pressing techniques for using conventional pressing equipment are very different from those used with commercial pressing equipment.

____

T F 4. A foot press is used to press an entire garment in one operation.

____

T F 5. A portable stream presser is used to steam garments on forms or hangers to open seams and darts during construction, and to press fabrics easily damaged by pressure.

____

T F 6. A temperature regulated iron offers a variety of temperature settings for smoothing or creasing fabrics.

____

T F 7. An iron stand is a metal plate that fits the sole of a steam iron and is used to prevent shine and scorching of fabric.

____

T F 8. An industrial ironing board is portable, while a conventional ironing board is permanently fixed in place.

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____

T F 9. A sleeve board is used to press areas that are hard to reach or will not fit on a regular ironing board.

____

T F 10. A clapper is used to prevent crushing of pile and napped fabrics such as velvet.

____

T F 11. A point presser is used to press and form sharp corners and to press open seams without pressing nearby fabric..

____

T F 12. A tailor's board is a wooden tool with a number of differently shaped edges and surfaces for pressing flat garment areas, points, and straight and curved seams.

____

T F 13. A seam stick has a wool pressing surface and a cotton pressing surface and is used to shape and mold curved areas such as collars and darts.

____

T F 14. A pressing cloth is a piece of wool, cotton, or linen used to protect fabric surfaces and ornamentation from shine or damage.

____

T F 15. Debris on the floor of a pressing work area should only be cleaned up at the end of the work day.

____

T F 16. Pressing surfaces should be padded with materials that reflect heat and will not scorch.

____

Activity 15-1 • True/False, cont'd.

T F 17. Before pressing, items should be sorted according to color.

____

T F 18. The temperature setting should be checked by testing the iron on a seam or hidden area of the garment before pressing.

____

T F 19. If the fabric shows a shine on the test area, press on the wrong side of the fabric or use a press cloth.

____

T F 20. When pressing layered surfaces, press the inside portion of the garment first.

____

T F 21. Press fabrics made from manufactured fibers before they are completely dry.

____

T F 22. Pressing soiled or stained fabrics can loosen the dirt or stain for easy removal.

____

T F 23. It is safe to use hot pressing equipment on buttons and zippers made from today's modern materials.

____

T F 24. The collars, yokes, and shoulders of dresses should be pressed first.

____

T F 25. The sleeves and cuffs of shirts should be pressed first.

____

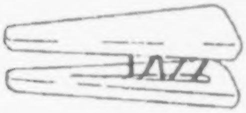
Activity 15-2 • Matching

Directions

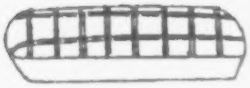
Match the pressing equipment with the correct illustration. Place the letter of the pressing equipment in the blank to the left of the illustration. Use the blanks provided under each illustration to give a brief definition of the equipment. Not all equipment terms will be used.

Illustration

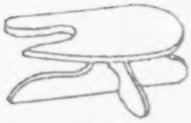
1. ____



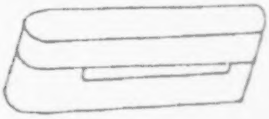
2. ____



3. ____



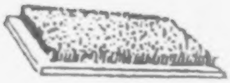
4. ____



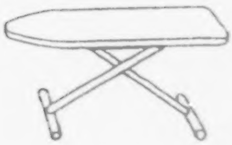
Pressing Equipment

A. Clapper
B. Conventional ironing board
C. Electric puff iron
D. Iron stand
E. Needle board
F. Point presser
G. Pressing cloth
H. Press mitt
I. Pressing form
J. Seam stick
K. Sleeve board
L. Sleeve roll
M. Tailor's board
N. Tailor's ham
O. Temperature regulated iron

5. ____

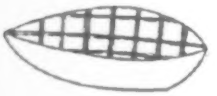


6. ____

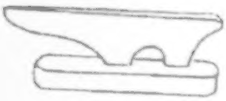


Activity 15-2 • Matching, cont'd.

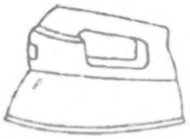
7. ____



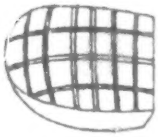
8. ____



9. ____



10. ____



Activity 15-3 • Research and Writing

Directions

Demonstrate your knowledge of various pressing techniques used in the construction and care of apparel by completing the following activity. In the space provided below, write a report discussing basic pressing techniques. You may use the back of this page if needed. In your report, include at least four of the following six items:

- the difference between pressing and ironing
- the rules used to determine the pressing requirements of specific fabrics
- three pressing methods
- guidelines for using pressing techniques effectively during construction
- methods for pressing construction details
- pressing the final garment after construction is completed

Pressing Techniques

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Chapter 16

Measuring for Custom-made Garments

Chapter Focus

The following Essential Knowledge and Skills are discussed in Chapter 16:

6A Demonstrate correct procedures utilized in garment fitting and alteration.

6D Describe types, use, and care of tools, equipment, and supplies used to alter, repair, and customize textile and apparel products.

Introduction

The measuring process is very important for achieving a good-looking, well-fitting garment. The body must be measured accurately so a pattern that is closest to the body measurements may be selected and alterations made where necessary. Men, women, and children are measured somewhat differently. There are many different figure types within these three groups. The pattern companies and manufacturers of clothing recognize the different groups of figures and have categorized them accordingly.

Activity 16-1 • True/False

Directions

Review factors to consider when measuring for custom-made garments and for selecting commercial patterns. Read each statement. If the statement is **True**, circle the letter **T** to the left of the statement. If the statement is **False**, circle the letter **F**. If the statement is **False**, rewrite it to make it **True**.

T F 1. A sloper is a basic pattern developed from specific measurements of a form or a live model.

____

T F 2. Personal measurement charts are not used for men and children.

____

T F 3. When using the pattern draping process for constructing patterns, muslin is used to construct the draped pattern on the form or live model.

____

T F 4. An asymmetrical figure is one with measurements that are the same on both sides of the body.

____

T F 5. Ease is the difference between the body measurement and the garment measurement at a given point.

____

T F 6. Most custom sewers create their own patterns for garment construction.

____

T F. 7. Pattern drafting is a system of pattern making that depends on a series of form or figure measurements to make a paper pattern.

____

T F 8. Apparel manufacturers generally measure live models in order to construct patterns for garments to be manufactured.

____

T F 9. Custom sewers should apply some ease to customers' body measurements when determining pattern size.

____

T F 10. Usually, when constructing a custom-made garment, the fabric is selected first.

____

Activity 16-1 • True/False, cont'd.

T F 11. Commercial patterns may have to be altered for each customer.

T F 12. The garment made from a commercial pattern is slightly smaller than the exact body measurements.

T F 13. Commercial patterns are produced by pattern companies and sold in fabric stores and department stores.

T F 14. Taking accurate measurements saves time during garment construction.

T F 15. If a client's measurements fall between two pattern sizes, the larger size should be selected if the garment is full or loose fitting.

T F 16. Suggested fabrics can be found on the front of the pattern envelope.

T F 17. In 1968, patterns were standardized so patterns from various pattern companies are based on the same measurements.

T F 18. If a client's measurements fall between two pattern sizes, the smaller size should be selected if the design of the garment is closely fitted.

T F 19. Garment dimensions (finished length and bottom circumference) can be found on the back of the pattern envelope.

T F 20. The amount of ease added to patterns may differ with patterns made by different pattern companies.

Activity 16-2 • Matching

Directions

Part 1

Match the measuring tools used for apparel construction with their major functions. Place the letter of the measuring tool in the blank to the left of the function. Each letter may be used once, more than once, or not at all.

Measuring Tool

A. Automatic hem gauge
B. Form
C. French curve
D. L-square
E. Ruler
F. Sewing gauge
G. Skirt marker
H. Sleeve gauge
I. Sleigh curve
J. Tape measure
K. Transparent ruler
L. Triangle
M. Yardstick

Function

_____ 1. Metal or plastic drawing guide with an edge that curves; used for marking and altering curved lines such as darts necklines, and curved hemlines

_____ 2. A 36" straight edged ruler

_____ 3. 1" or 2" wide and has a clear plastic straight edge; used when guidelines and marks must be seen through the ruler

_____ 4. Narrow, flexible tape with measurements both in metric terms and inches; used to take body measurements

_____ 5. Ruler attached to a weighted base; used to mark hems while a garment is on a form or human body

_____ 6. Guide shaped in a spiral curve that aids in altering patterns and in redrawing construction lines

_____ 7. Three-sided tool with two sides of equal length meeting at a ninety degree angle; used to mark corners and angles on patterns

_____ 8. Wooden, plastic, or metal ruler with two arms of different lengths used for straightening grains, altering tissue patterns, and other marking tasks

_____ 9. Rectangular guide with graduated markings from 1/4" to 2 1/2"; used to turn garment hems and edges

_____ 10. Straight edged strips of metal, wood, or plastic marked with measurements

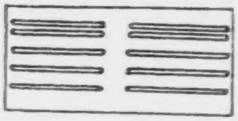
_____ 11. Short ruler with an indicator slide that can be set on any point; used in measuring short distances such as hems

_____ 12. Standardized duplication of a human torso

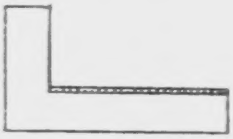
Part 2

Match the measuring tool for apparel construction with the correct illustration. Place the letter of the measuring tool (listed on the previous page) in the blank to the left of the illustration.

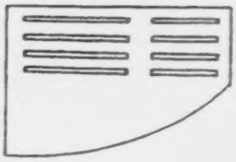
_____ 13.



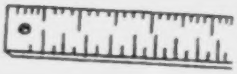
_____ 14.



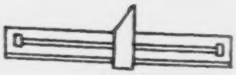
_____ 15.



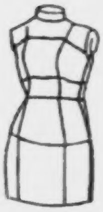
_____ 16.



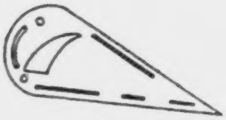
_____ 17.



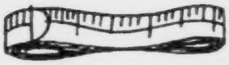
_____ 18.



_____ 19.



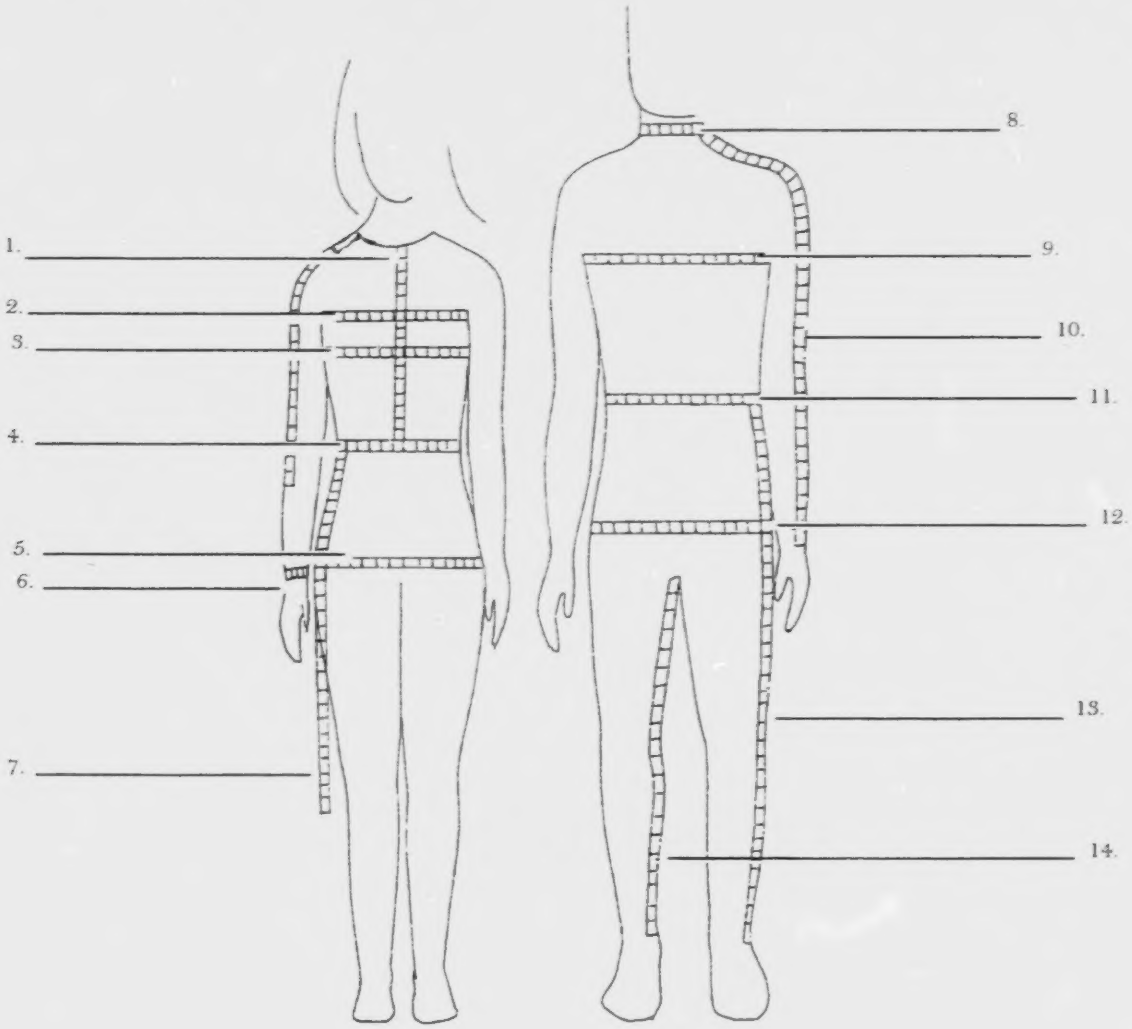
_____ 20.



Activity 16-3 • Identification

Directions

Review procedures for measuring the human body by completing the following activity. Indicate which areas of the body are being measured by writing the name of the measurement in the blank next to each tape measure.



Activity 16-4 • Matching

Directions

Complete the following activity to review figure types for females, males, and children. Match the figure type with the best description. Place the letter of the figure type in the blank to the left of the description. Letters may be used more than once.

Figure Type

A. Babies
B. Boys
C. Children's
D. Chubbie
E. Girls
F. Half-size
G. Junior
H. Junior Petite
I. Men's
J. Misses'
K. Miss Petite
L. Teen-boys'
M. Toddlers
N. Women's
O. Young Junior/Teen

Description

_____ 1. 5'4" tall, well-developed, shorter back waist length and higher bustline than Misses'

_____ 2. Growing girls, weight is above average for age and height

_____ 3. Infants who are not walking, ease is allowed for diapers

_____ 4. Young males who are growing

_____ 5. Similar to Boys' sizes; height is taller than Boys'

_____ 6. Males with average height of 5'10"

_____ 7. Narrower shoulder measurement than Misses'

_____ 8. 5'2" to 5'3" tall, larger waist, shorter back waist length, narrower shoulders than Misses'

_____ 9. 5'5" tall, well-developed, well-proportioned, average figure type

_____ 10. Males who have not developed adult proportions

Activity 16-4 • Matching, cont'd.

_____ 11. Shoulder, arm, and dress lengths are longer than Toddlers'

_____ 12. Taller than other female figure types except Women's

_____ 13. For toddlers who are between babyhood and childhood; ease is allowed for diapers

_____ 14. Males with mature body build

_____ 15. 5' to 5'1" tall, fully developed figure, shorter than Junior

_____ 16. 5'2" to 5'4" tall, proportions similar to Misses'; shorter overall than Misses'

_____ 17. Approximately 5'4" tall; well-developed; shorter back waist length and higher bustline than Misses'

_____ 18. Same breast and waist measurements as Toddlers', taller than Toddler

_____ 19. 5'5" to 5'6" tall, larger figure overall than Misses' in height and proportions

_____ 20. Female figures that have not begun to mature

Activity 16-5 • Application

Directions

Determine what pattern size each of the following figure types should use by checking the size range charts. Remember that few figure types have all of the exact measurements listed for their sizes. Some adjustments may need to be made to a pattern. Assume the garment to be made is closely fitted and the larger size should be selected when the measurements fall between two sizes. Fill in the correct size pattern in the *Pattern Size* column.

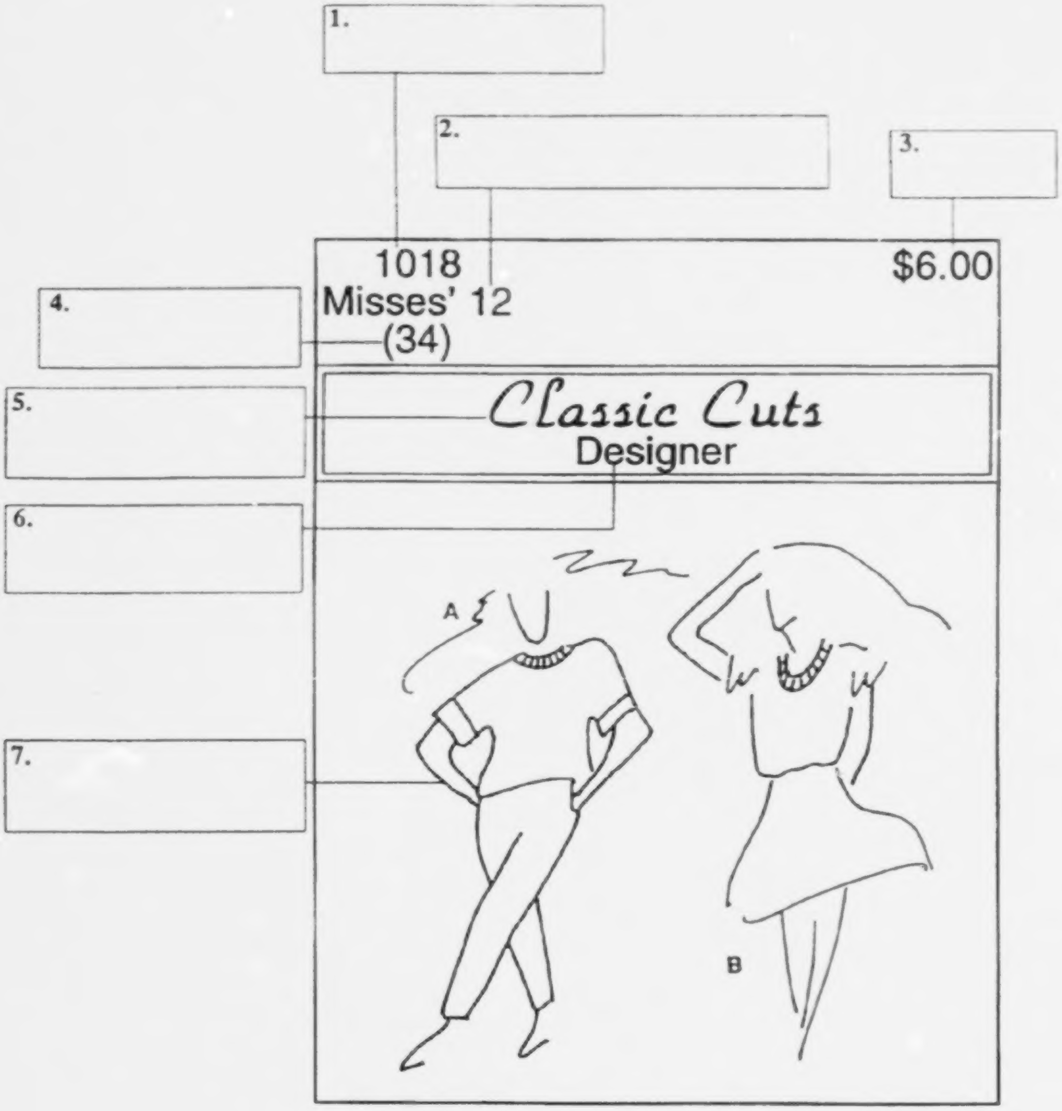
Figure Type	Chest/Bust	Waist	Hips	Back Waist Length	Pattern Size
Junior	30"	23 1/2"	33"	15 1/4"	
Women's	50"	41 1/2"	50"	17 5/8"	
Young Junior/Teen	30 1/2"	24"	33 1/2"	14 1/2"	
Miss Petite	38"	30 1/2"	38"	15 3/4"	
Misses'	34"	26 1/2"	35"	16 1/4"	
Men's	42"	34"	43"	16"	
Boys'	27"	24"	28"	11 3/4"	
Teen-Boys'	36 1/2"	30"	37"	15"	
Children's	23"	21"	24"	9 1/2"	
Girls'	21"	23 1/2"	27"	12'	

Activity 16-6 • Application

Directions

Part 1

Identify the parts of the pattern envelope by filling in the boxes with the correct terms.



Part 2

List three types of information found on the back of the pattern envelope.

8. ______________________________

9. ______________________________

10. ______________________________

Chapter 17

Pattern Alteration Procedures

Chapter Focus

The following Essential Knowledge and Skills are discussed in Chapter 17:

6A Demonstrate correct procedures utilized in garment fitting and alteration.
6B Describe characteristics of proper fit in garments.
6C Determine alterations to solve common fitting problems resulting from individual differences and special needs.
6E Apply elements and principles of design in altering, repairing, and customizing textile and apparel products.
6F Utilize appropriate techniques and processes to alter, repair, and customize textile and apparel products according to quality standards.

Introduction

Pattern alteration is changing a pattern in order to achieve proper fit and appearance. Custom sewers, pattern makers, and designers should understand how pattern alterations are performed in order to construct garments that fit properly. Basic pattern alteration techniques are similar for different styles of garments. Once basic pattern alteration techniques are learned, garments with accurate fit can be produced.

Activity 17-1 • Multiple Choice

Directions

Complete the following activity to review characteristics of a well-fitted garment. For each item, select the *best* answer from the choices provided. Place the letter of the response in the blank to the left of the numbered item.

_____ 1. Yarns that are horizontal across the body include the
A. design ease
B. correct balance
C. crosswise grain
D. wearing ease

_____ 2. When a garment hangs the same distance from the body form right to left and front to back, it is properly
A. altered
B. balanced
C. eased
D. set

_____ 3. Some of the body bulges that must be considered when fitting a garment are the
A. ankle, thigh, and neck
B. bust, elbow, and abdomen
C. hand, foot, and head
D. wrist, calf, and back

_____ 4. Garment lines may be
A. balanced and set
B. decorative and structural
C. easable and silhouetted
D. loose and tight

_____ 5. Wearing ease is necessary for movement and comfort within a garment, whereas design ease is
A. balance
B. circumference seams
C. designed-in fullness
D. lengthwise grain

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Activity 17-1 • Multiple Choice, cont'd.

_____ 6. To evenly distribute ease it must be added to
A. all four quarters of the garment
B. the back of a garment
C. the front of the garment
D. vertical seams only

_____ 7. The grain on the right half of the body should
A. be balanced
B. be constructed from a different fabric
C. have sufficient wearing ease
D. match the grain on the left of the body

_____ 8. Construction lines include
A. armholes, waistlines, and necklines
B. necklines, waistlines, and hemlines
C. pockets, pleats, and hemlines
D. yokes, seam lines, and necklines

_____ 9. If 4" of ease are needed, each quarter of the garment should be allowed
A. 1/2" of ease
B. 3/4" of ease
C. 1" of ease
D. 1 1/2" of ease

_____ 10. Smooth seams that follow the natural curves of the body are
A. circumference seams
B. pleats
C. silhouette seams
D. tucks

Activity 17-2 • True/False

Directions

Complete the following activity to review factors to consider when selecting patterns. Read each statement. If the statement is **True**, circle the letter **T** to the left of the statement. If the statement is **False**, circle the letter **F**. If the statement is **False**, rewrite it to make it **True**.

T F 1. The client's measurements should be compared to those on the pattern envelope.

____

T F 2. Measurements for a child should be taken each time a pattern is purchased.

____

T F 3. All pattern companies make their patterns to fit the body exactly the same.

____

T F 4. Patterns are designed and sized to fit average figures.

____

T F 5. If a pattern fits one area of the body well, it will fit all other areas of the body well.

____

T F 6. For a finished garment to fit well, the pattern must be adjusted prior to the garment being constructed.

____

T F. 7. Major pattern companies use different sets of measurements for the bust, hip, waist, and back waist length.

____

T F 8. Adults' measurements do not need to be checked after they have been recorded on a personal measurement chart.

____

T F 9. Clients do not need to have their exact measurements with them when choosing a pattern since patterns can always be altered to fit.

____

T F 10. The principles and elements of design should be considered when selecting a pattern.

____

Activity 17-3 • Writing

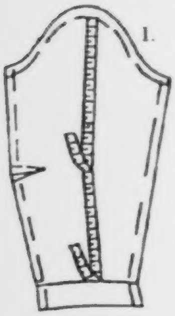
Directions

Part 1

Write a paragraph explaining the importance of taking accurate client measurements, and describe procedures for comparing measurements to pattern pieces. Include what measurements should be taken on clients in order to achieve a good fit.

Part 2

Next to each pattern piece, identify what measurement is being checked, explain how the measurement is taken, and determine how the pattern measurement is compared to the client's measurements.



1. Measurement: ____________________

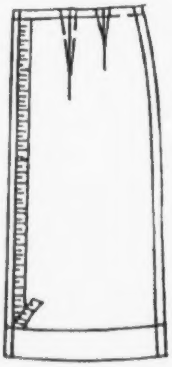
____

____

____

____

____



2. Measurement: ____________________

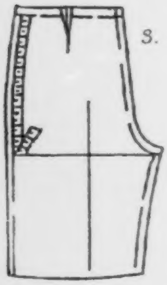
____

____

____

____

____



3. Measurement: ____________________

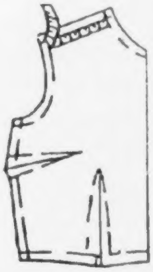
____

____

____

____

____



4. Measurement: ____________________

____

____

____

____

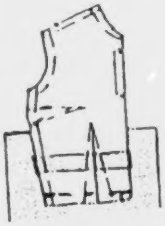
____

Activity 17-4 • Identification

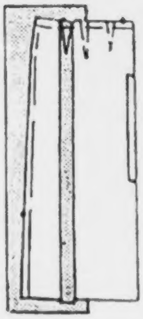
Directions

Apply procedures for completing basic pattern alterations by completing the following activity. The following pattern pieces are being altered in some way. On the line below each pattern piece, explain what pattern piece is being altered and how it is being altered. See the example below.

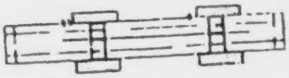
example:



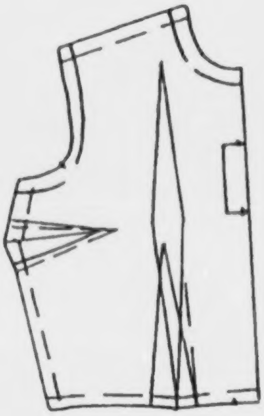
increasing length
on a bodice



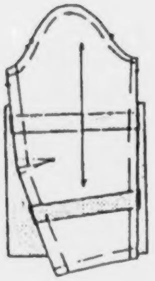
1. ______________________
____



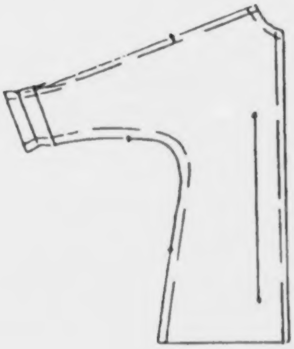
2. ______________________
____



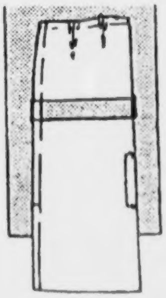
3. ______________________
____



4. ______________________
____

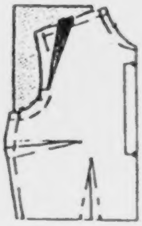


5. ______________________
____



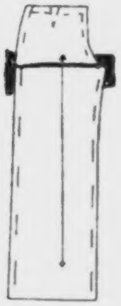
6. ______________________
____

Activity 17-4 • Identification, cont'd.



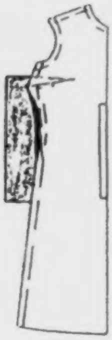
7. ____________________

____



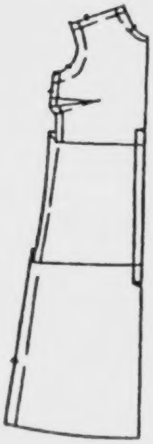
8. ____________________

____



9. ____________________

____



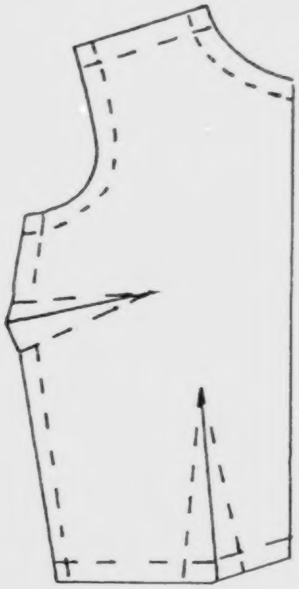
10. ____________________

____

Directions

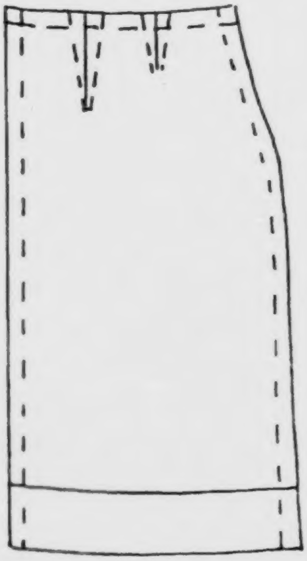
List the characteristics of good pattern fit for each pattern piece shown. Write the designated number of characteristics for each pattern piece in the spaces provided beside each pattern piece.

1.



1. ______________________
2. ______________________
3. ______________________
4. ______________________
5. ______________________
6. ______________________

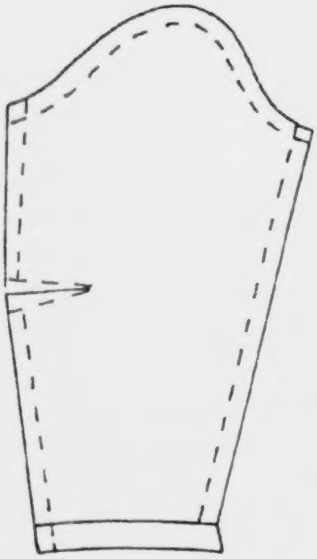
2.



1. ______________________
2. ______________________
3. ______________________
4. ______________________
5. ______________________

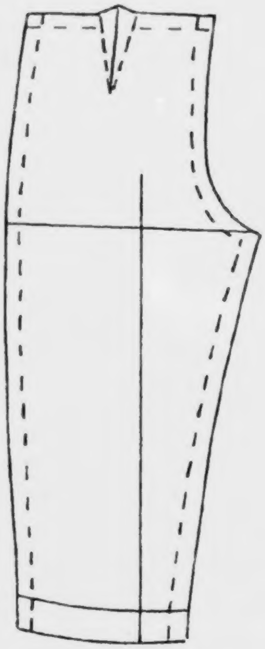
594

3.



1. ______________________________
   ____
2. ______________________________
   ____
3. ______________________________
   ____
4. ______________________________
   ____

4.



1. ______________________________
   ____
2. ______________________________
   ____
3. ______________________________
   ____
4. ______________________________
   ____
5. ______________________________
   ____

Activity 17-6 • Case Studies

Directions

Complete the following activity to compare procedures for combining patterns of different styles and patterns of different sizes. Read the following case studies. Use the spaces provided to write a response for each question.

1. Nancy has found a pattern for her prom dress, but her mother thinks the neckline is too low in the front. Nancy's mother is making the dress for her, and she thinks the neckline from her niece's wedding dress pattern would look perfect. What is one factor Nancy's mother should consider when contemplating combining the two patterns?

2. Sharon has an upper body that is a size smaller than her lower body. She has found that making fitted dresses is difficult. What would be the easiest way for Sharon to produce a pattern with her measurements to make a dress with a waistline seam?

3. LaTisha is on a limited budget. She just finished making two dresses and wants to make a third combining features from the two dress patterns she used. LaTisha wants to put the collar and sleeves from one dress onto the bodice of the other dress. What are two features LaTisha will need to check to be certain she can combine the two patterns without making major alterations?

4. Kevin is designing a fitted formal for his sister to wear to the military ball. Rather than making the entire pattern from scratch, he is planning on combining a bodice pattern from one pattern with a skirt pattern from a different pattern. What is one guideline that Kevin will want to follow when joining these two patterns?

Chapter 18

Unit Construction Techniques

Chapter Focus

The following Essential Knowledge and Skills are discussed in Chapter 18:

5D Differentiate procedures and techniques appropriate for varied production systems to achieve quality apparel products.

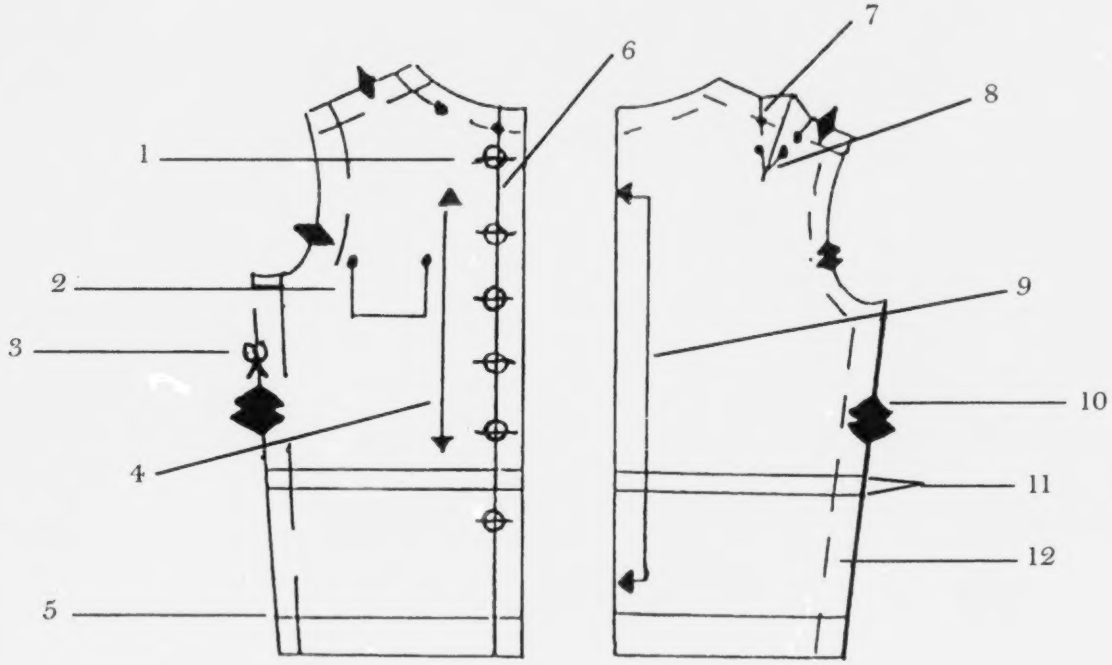
5E Utilize established production procedures and processes to achieve quality standards in finished products.

Introduction

The construction of a garment involves many steps. The unit method of construction is an organized way to complete these steps. If done correctly, this method will help ensure accurate and professional results. Understanding and being able to follow a pattern guide sheet will be very helpful in constructing a garment. Additional fundamental knowledge of facings, interfacings, linings, seams, casings, hems, collars, sleeves, waistbands, pockets, and zippers is beneficial when constructing a garment.

Directions

Identify the numbered symbols on the pattern pieces illustrated below. Write each response in the corresponding numbered blank located at the bottom of this page.



1. ______________________
2. ______________________
3. ______________________
4. ______________________
5. ______________________
6. ______________________
7. ______________________
8. ______________________
9. ______________________
10. ______________________
11. ______________________
12. ______________________

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Activity 18-2 • Short Answer

Directions

Review the aspects of fabric preparation by responding to the following items. Record your answers in the spaces provided.

1. Why is it important to preshrink fabric before construction?

2. Describe the correct method for preshrinking each of the following types of fabrics.
   - hand-washable fabrics
   - washable fabrics
   - dry cleanable fabrics

3. Why should interfacings, linings, trims, and zippers be preshrunk?

4. Describe the method of preshrinking trims and tapes.

5. When is a fabric considered on-grain?

6. Why is it important to straighten off-grain fabric before cutting out garment pieces?

Activity 18-2 • Short Answer, cont'd.

7. What is the difference between ***bias*** and ***true bias***?

8. List the steps for straightening fabric using the following methods:
   - tearing the fabric
   - cutting fabrics with a prominent design
   - pulling a crosswise yarn
   - pulling on the fabric

9. Explain how to determine whether fabric is on-grain once the ends of the fabric are straightened.

10. Describe the procedure to follow when a fabric cannot be straightened.

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Activity 18-3 • Short Answer

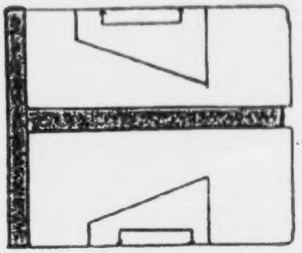
Directions

Review the procedures for pattern layout and cutting by completing the following exercise.

Part 1

For each of the following, (A) identify the type of fold and (B) provide a brief description. Use the blanks provided to the right of the illustration.

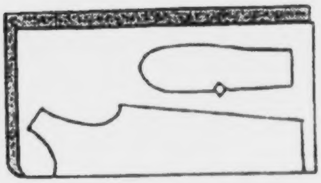
1.



(A) ______________________________

(B) ______________________________

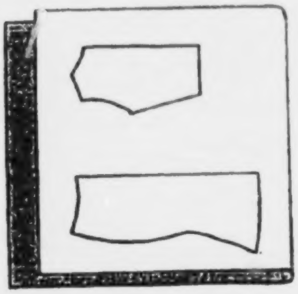
2.



(A) ______________________________

(B) ______________________________

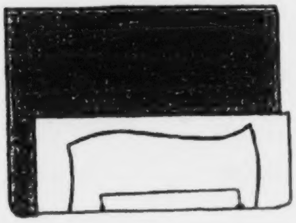
3.



(A) ______________________________

(B) ______________________________

4.



(A) ______________________________

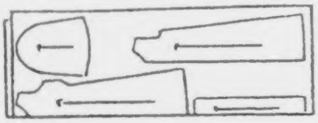
(B) ______________________________

Activity 18-3 • Short Answer, cont'd.

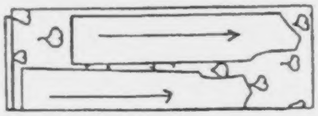
Part 2

Below are pattern layouts for special fabrics. In the space provided next to each illustration, provide a brief description of how pattern pieces should be placed on the designated fabric type.

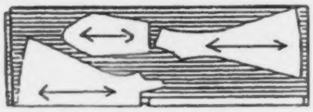
5. Napped fabric:



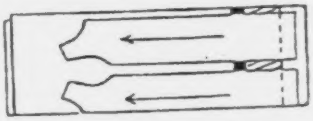
6. Directional prints:



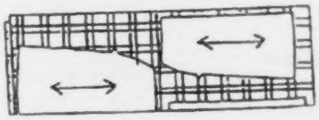
7. Evenly striped fabric:



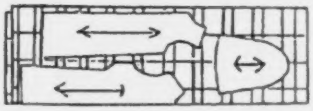
8. Border prints:



9. Uneven plaid fabric:



10. Even plaid fabric:



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Activity 18-4 • Writing

Directions

Select two methods of transferring markings to fabric, and write one paragraph about each method. Include information such as how the markings are made and when the marking method is the best one to use.

Marking Method #1

Marking Method #2

Activity 18-5 • True/False

Directions

Complete the following activity to review procedures for constructing and attaching facings, interfacings, and linings. Read each statement. If the statement is **True**, circle the letter **T** to the left of the statement. If the statement is **False**, circle the letter **F**. If the statement is **False**, rewrite it to make it **True**.

T F 1. A facing should not be visible from the outside of the garment.

____

T F 2. A fitted facing is cut in one piece with the garment piece, while a self-facing is made of a separate piece of fabric that is sewn to the edge of the garment.

____

T F 3. Interfacing gives support to garment areas by changing the hand of the garment fabric.

____

T F 4. Interfacing that is woven or knitted should be cut on the same grain line as the facing and the garment.

____

T F 5. Fusible interfacing has a heat-activated adhesive that sticks when ironed.

____

T F 6. Nonfusible interfacing must be stitched to the garment.

____

Activity 18-5 • True/False, cont'd.

T F 7. A general rule is that interfacing should be heavier in weight than the garment fabric.

____

T F 8. Fusible interfacing can be attached to either the garment piece or facing piece.

____

T F 9. A free-hanging lining is often used in jackets, sleeves, and pants.

____

T F 10. The weight of the lining fabric should be heavier than that of the garment fabric for added shape.

____

Activity 18-6 • Sentence Completion

Directions

Complete the following activity to demonstrate your knowledge of methods of constructing seams, casings, and hems. For each item, write in the word or words that best complete(s) each sentence.

1. When two edges of unequal length are sewn together, the seams are eased or ______________________________.

2. A casing is a fabric tunnel that holds a drawstring or ______________________________ in place.

3. Casings are used on waistlines, sleeves, hemlines, and necklines to help control ______________________________.

4. A ______________________________ is formed by folding the edge of a garment over and stitching it into place.

5. To keep a drawstring from coming out of the casing during washing, the ends should be ______________________________.

6. A ______________________________ can be used to pull a drawstring through a casing.

7. An ______________________________ casing is formed by sewing a separate piece of fabric to the edge of the garment.

8. The type of casing suitable for garments made of bulky fibers are ____________________ casings.

9. Gathers are formed by pulling the ______________________________ thread and sliding the fabric along the thread.

10. Most ______________________________ are made by turning the raw edge of fabric to the inside of the garment..

11. Before a garment is hemmed, it should hang from a hanger for ____________________ hours.

Activity 18-6 • Sentence Completion, cont'd.

12. A ______________________________ finish is produced by placing seam tape, bias tape, or lace 1/4" over the raw edge of the hem and stitching.

13. The hem will adhere to the fabric without stitching when ______________________________ web is placed between the garment and the hem and then pressed.

14. Machine stitched hems are used for the bottom of shirts and blouses, but most hems are sewn by ______________________________.

15. A ______________________________ is a row or rows of stitching that hold(s) two or more layers of fabric together.

16. Soft, even folds are created by the process called ______________________________.

17. When stitching two seam edges of unequal lengths together, the seam that has subtle shaping and is smooth and unpuckered is the ______________________________ seam.

18. Fabric is usually gathered to 1/2 or ______________________________ of its original width.

19. Casings should be about ______________________________ inches wider than the drawstring or elastic that will be enclosed.

20. ______________________________ tape can be used to construct an applied casing.

Activity 18-7 • Short Answer

Directions

Apply your knowledge of procedures for constructing and attaching collars, sleeves, waistbands, and sleeve finishes by completing the following activity. In the space provided, write a brief description for each of the items listed below.

1. Rolled collar: ______________________________

2. Flat collar: ______________________________

3. Standing collar: ______________________________

4. Shirt collar: ______________________________

5. Kimono sleeves: ______________________________

6. Raglan sleeves: ______________________________

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7. Fold-up cuff: ______________________________

8. Set-in sleeves: ______________________________

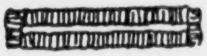
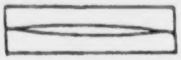
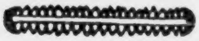
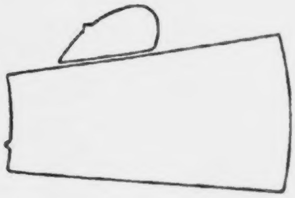
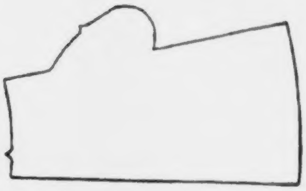
9. Plain waistband: ______________________________

10. Top-stitched waistband: ______________________________

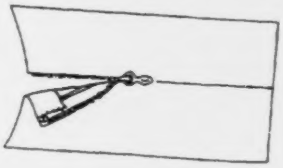
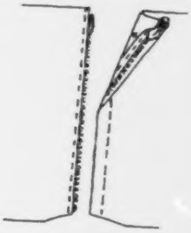
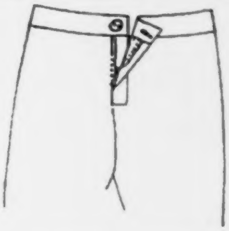
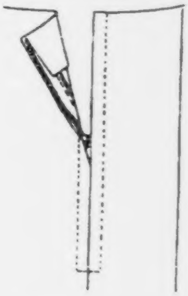
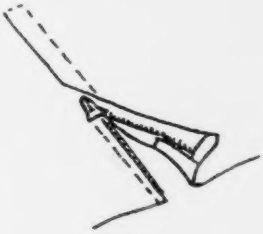
Activity 18-8 • Short Answer

Directions

Review methods of forming buttonholes and attaching pockets and zippers. Complete the box by (A) identifying the illustration and (B) writing a brief description for the illustration.

Illustration	Identification	Description
1. 		
2. 		
3. 		
4. 		
5. 		

Activity 18-8 • Short Answer, cont'd.

Illustration	Identification	Description
6. 		
7. 		
8. 		
9. 		
10. 		

612

Activity 18-9 • Writing

Directions

Write a brief report discussing the importance of fitting garments during stages of unit construction. Include the number of fittings that should be done and describe steps to follow before and during each fitting.

Fitting is Important!

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Chapter 19

Garment Alterations: Fitting and Marking

Chapter Focus

The following Essential Knowledge and Skills are discussed in Chapter 19:

6B Describe characteristics of proper fit in garments.

6C Determine alterations to solve common fitting problems resulting from individual differences and special needs.

Introduction

Alterations are used to change a garment so that it fits well and is more comfortable and attractive. A good fitting garment enhances a person's image. The most perfectly constructed garment will fail to complement the wearer if it does not fit well. Chapter 19 identifies problems often encountered in fitting garments and describes methods of marking garments for alterations.

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Activity 19-1 • Puzzle

Directions

Review characteristics of good fit in a garment for women and men by completing the following activity. The crossword puzzle has the answers filled in, but the clues are missing. Down the left side of a separate sheet of notebook paper, list the numbers listed below under Across and Down. Beside each number, write a clue for each answer.

1 g	r	2 a	i	n	■	l	i	n	e								
a		r															
r		m															
m		3 h	i	p	■	l	i	n	e								
e		o															
n		l									4 w						
t		e		5 s	i	d	e	■	s	e	a	m					
■				h							i						
l				o							s						
e				u				6 b	u	t	t	o	n	h	o	l	e
7 n	e	c	k	l	i	n	e				l						
g				d							i						
t		8 s	l	e	e	v	e	■	l	e	n	g	t	h			
h				r							e						

Across

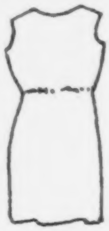
1.
3.
5.
6.
7.
8.

Down

1.
2.
4.
5.

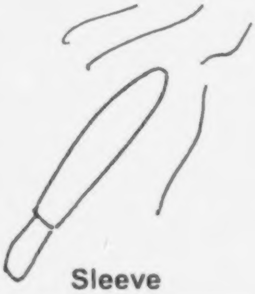
Directions

Review common fitting problems for women's garments by completing the following activity. Below each picture, list the different fit problems that can occur with the garment or the area of the garment shown.


1 **Dress**

2 **Neckline**

3 **Bodice**


4 **Sleeve**

5 **Skirt**

6 **Slacks**

Activity 19-3 • Writing

Directions

Write a brief report discussing the common fitting problems for men's garments. In the report, address the particular problems that may occur when fitting men's jackets, pants, and shirts.

Fitting Problems for Men's Garments

Activity 19-4 • True/False

Directions

Review basic techniques used to mark garments for alteration. Read each statement. If the statement is **True**, circle the letter **T** to the left of the statement. If the statement is **False**, circle the letter **F**. If the statement is **False**, rewrite it to make it **True.**

T F 1. A skirt marker or hem marker is an easy way to mark the hem of a shirt or dress.

____

T F 2. Clip markings are not a good method of marking because the garment might need to be let out in the future and the clips would prohibit additional alterations.

____

T F 3. Thread markings are safe and the most appropriate for fabrics such as lace, chiffon, and organdy.

____

T F 4. Tailor's chalk is long lasting and can be used for intricate alterations.

____

T F 5. Pin fitting is an inaccurate, poor marking technique.

____

T F 6. Placing pins away from the customer's body will help avoid the pins sticking the customer.

____

Activity 19-4 • True/False. cont'd.

T F. 7. Marking a garment with a lead pencil or ballpoint pen is a professional method of marking.

____

T F 8. Tailor's wax is suitable for marking garments made from cotton and wool.

____

T F 9. Pin fitting is more effective in garments that are too small or too tight than in garments that are too large or too loose.

____

T F 10. For thread markings, it is best to use dark colored thread since it is easier to see.

____

Chapter 20

Garment Alterations: Adjustments

Chapter Focus

The following Essential Knowledge and Skills are discussed in Chapter 20:

6A Demonstrate correct procedures utilized in garment fitting and alteration.

6C Determine alterations to solve common fitting problems resulting from individual differences and special needs.

6F Utilize appropriate techniques and processes to alter, repair, and customize textile and apparel products according to quality standards.

Introduction

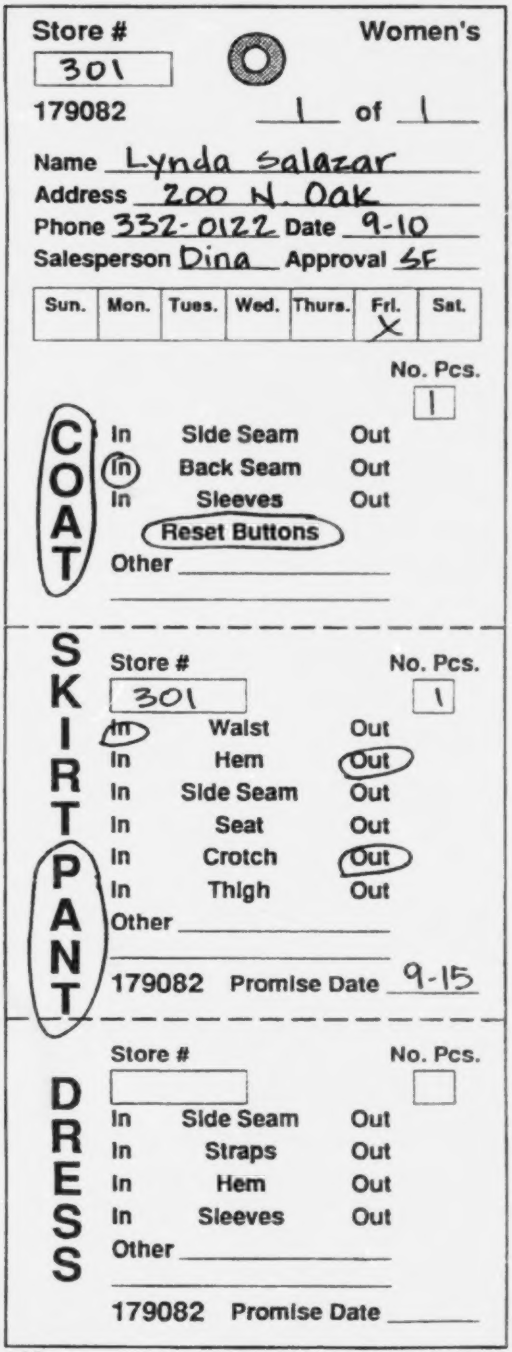
The skills of good alterationists are in demand in today's service-oriented society. Employment opportunities for alterations include retail stores, commercial dry cleaners, commercial laundries, and custom sewing and alteration businesses. Chapter 20 covers procedures for interpreting and performing adjustments on various garments. General procedures for altering children's clothes are also covered.

Activity 20-1 • Short Answer

Directions

Part 1

Interpret alteration tags and symbols used to mark garments by completing the following activity. A completed alteration tag is pictured below. Read the information given on the tag and answer the questions in the space given. Complete sentences are not required in responses.



Store # 301 **Women's**

179082 1 **of** 1

Name Lynda Salazar

Address 200 N. Oak

Phone 332-0122 **Date** 9-10

Salesperson Dina **Approval** SF

Sun.	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.
					X	

No. Pcs. 1

[✓ COAT]

In **Side Seam** Out

[✓ In] **Back Seam** Out

In **Sleeves** Out

[✓ Reset Buttons]

Other __________

SKIRT / **[✓ PANT]**

Store # 301 **No. Pcs.** 1

[✓ In] **Waist** Out

In **Hem** [✓ Out]

In **Side Seam** Out

In **Seat** Out

In **Crotch** [✓ Out]

In **Thigh** Out

Other __________

179082 **Promise Date** 9-15

DRESS

Store # ☐ **No. Pcs.** ☐

In **Side Seam** Out

In **Straps** Out

In **Hem** Out

In **Sleeves** Out

Other __________

179082 **Promise Date** ______

1. What is the customer's name?

2. What is the customer's phone number?

3. What is the customer's address?

4. Who is the salesperson?

5. What date was the fitting done?

6. What date will the garment be ready?

7. How many total garment pieces are being altered for the customer on this ticket?

8. What alterations are to be done on the coat?

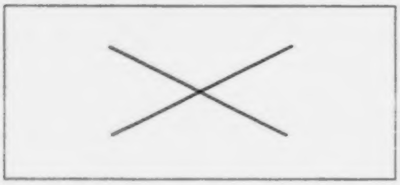
9. What alterations are to be done on the pants?

10. What is the ticket identification number?

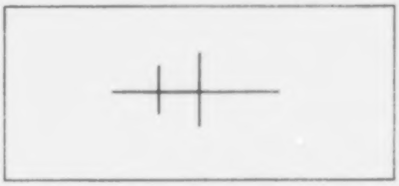
Activity 20-1 • Short Answer, cont'd.

Part 2

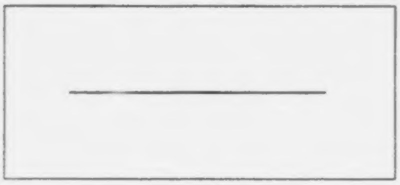
Five alteration symbols which may be marked on garments are shown below. In the space below each symbol, interpret what the symbol means.



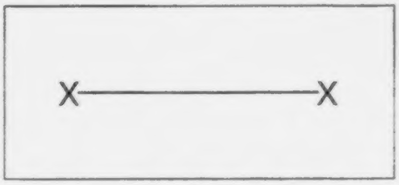
11. ____________________



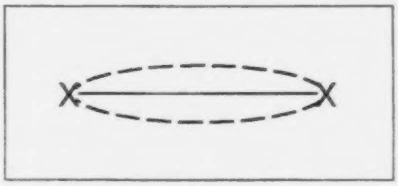
12. ____________________



13. ____________________



14. ____________________



15. ____________________

Activity 20-2 • Matching/Sequencing

Directions

Part 1

Complete the following activity to review procedures for altering waistlines and hip lines of dresses. Listed in the left column are fitting problems related to dress waistlines and hip lines. Listed in the right column are alteration procedures. Draw a line connecting each fitting problem with the alteration procedure that should be used to correct it.

Fitting Problems

1. Side seams pull and closures are strained at the dress waistline.
2. The wearer of the dress constantly feels the need to pull the dress down because the waistline falls above the natural waistline.
3. The dress waistline is too loose with too much fabric around the waist.
4. An excess amount of fabric bunches up below the waist because the bodice is too long.
5. The bodice of the dress has excess folds of fabric around the waistline

Alteration Procedures

A. lower the waistline

B. raise the waistline

C. increase the waistline

D. decrease the waistline

E. increase the hip line

Part 2

Below are several lists of steps which should be followed when performing different alterations. The steps are not listed in the correct order. Place a number 1 in the blank to the left of the step which should be completed first and then number the remaining steps in the order in which they should be performed.

Raising or Lowering a Dress Waistline

_____ 1. Rip the waistline seam to separate the bodice from the skirt.

_____ 2. Press the seam toward the bodice, trimming away any excess seam allowance as needed.

_____ 3. Determine the location of the natural waistline and mark it with a row of pins or tailor's chalk. Mark the waistline on the skirt if lowering the waistline; mark on the bodice if raising the waistline.

_____ 4. If there is a zipper, remove the lower portion extending 2 inches above the waistline.

_____ 5. Sew the bodice and skirt together on the new bodice seam line.

_____ 6. Pin the bodice and skirt back together where indicated by the chalk or pin line.

Increasing or Decreasing a Dress Waistline

_____ 1. Restitch each side seam along the new marking, tapering off to the original seam under the arm and down toward the hip line.

_____ 2. Rip the side seams open from the waistline seam.

_____ 3. If additional adjustment is needed, alter the waistline darts in equal amounts in both the skirt and bodice and resew the waistline seam.

_____ 4. Press the new seams open.

_____ 5. Mark the new stitching line on the seam allowances with tailor's chalk or pins.

Increasing a Dress Hip Line

_____ 1. Press the new seams open.

_____ 2. If additional width is needed in a garment with center front and center back seams, these seams may also be released.

_____ 3. Restitch the side seams along the new markings, tapering off to the original seam.

_____ 4. Mark the new stitching line on the seam allowances with tailor's chalk or pins.

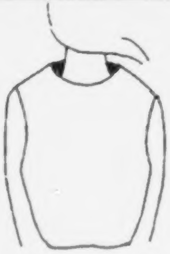
_____ 5. Rip the side seams apart from 2 inches below the waist to approximately 6 to 8 inches below the hip line.

Activity 20-3 • Application

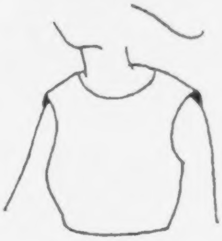
Directions

Complete the following activity to demonstrate your knowledge of procedures for altering necklines and shoulders of blouses and shirts. For each fitting problem pictured or described below, select the correct alteration procedure. Write the correct procedure in the space provided.

1. **Garment is too tight across the shoulders**

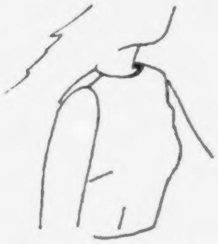
2. 

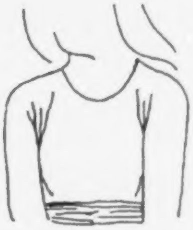
3. **Back neckline is too tight**

4. 

5. **Neckline is too tight**

6. **Sloping shoulders cause gathering and folds at armholes**

7. 

8. 

9. **Neckline is too high** ____________________ ____________________ ____________________	10. **Bodice back has vertical folds** ____________________ ____________________ ____________________

Activity 20-4 • True/False

Directions

Complete the following activity to review techniques for altering bodices and sleeves. Read the following statements. If the statement is **True**, circle the letter **T** to the left of the statement. If the statement is **False**, circle the letter **F**. If the statement is **False**, rewrite the statement to make it **True**.

T F 1. Procedures for decreasing bodice fullness are identical to procedures for increasing fullness, except that side seams are taken up rather than let out.

____

T F 2. One of the primary techniques used for changing bodices on men's garments is through the use of darts.

____

T F 3. When the bodice area of a garment has too much fullness, it pulls across the back and chest, strains fasteners, and creates gaps.

____

T F 4. The bust darts in the bodice should extend 1/2 inch beyond the bust point.

____

T F 5. It is always possible to alter darts in a garment, although some alterations are more difficult than others.

____

T F 6. Waistline darts are often removed completely for a very slender figure.

____

T F 7. When shortening waistline darts, it is only necessary to release the section of the waistline seam that allows access to the waistline darts.

____

T F 8. Sleeves should be altered after other portions of the garment have been altered.

____

Activity 20-4 • True/False, cont'd.

T F 9. To correct the problem of tight sleeves, seam allowance are taken in.

____

T F 10. A gusset may be applied to a sleeve to add fullness.

____

T F 11. A gusset is a square piece of identical or similar fabric inserted to provide ease of movement and increased strength.

____

T F 12. Sleeves that are too loose may not be noticed by the customer.

____

T F 13. Loose fitting sleeves detract from the overall appearance of a garment.

____

T F 14. It is not necessary to release the armseye seam if only the upper portion of a sleeve is being adjusted.

____

T F 15. The alteration to shorten cuffed sleeves is usually performed on men's shirts.

____

T F 16. Remove the stitching line of the old dart before marking a new stitching line.

____

T F 17. No markings are usually necessary when correcting the problem of tight waistline darts.

____

T F 18. A gusset should be made from the original fabric.

____

T F 19. To increase fullness in sleeves, it is necessary to remove the sleeve from the bodice.

____

T F 20. It may be possible to taper new stitching to the old seam lines when taking up a large amount of fullness in sleeves.

____

Activity 20-5 • Short Answer

Directions

To review procedures for altering the waistlines and hip lines of skirts, respond to the following items. Record your answers in the spaces provided.

1. Describe the characteristics of a waistline that is too tight. What is an alteration procedure that could be used to correct the problem?

2. Describe the characteristics of a waistline that is too loose. What is an alteration procedure that could be used to correct the problem?

3. List four construction details that might be adjusted to increase or decrease the waistline.

4. Describe the characteristics of a skirt that is too small in the hips. What is an alteration procedure that could be performed to correct the problem?

5. Describe the characteristics of a skirt that is too large through the hip area. What is an alteration procedure that could be performed to correct the problem?

Activity 20-6 • Sequencing

Directions

Below are several lists of steps involved in increasing fullness and decreasing fullness in the crotch area of pants and slacks. These steps are not listed in the correct order. Place a number **1** in the blank to the left of the step that should be completed first. Then number the remaining steps in the order in which they should be performed.

Increasing Fullness of Crotch

_____ 1. Check the amount of seam allowance tucked in the waistband by releasing a small amount of the waistband before ripping the entire waistband off. Determine if there is enough extra fabric for the alteration.

_____ 2. Determine the amount of additional ease needed by comparing the garment measurement and the body measurement. The crotch seam should fall approximately 1/2 to 1 inch below the body. Write the amount of additional ease needed on the alteration tag.

_____ 3. Release the waistband from the slacks or pants in the front if the crotch is tight in the front only. If the crotch is tight only in the back, release the waistband in the back. Mark the new seam line with tailor's chalk along the upper edge of the waistline.

_____ 4. Press the new waistline seam.

_____ 5. Stitch the waistband back on the slacks or pants along the new waistline seam.

Decreasing Fullness in Crotch

_____ 1. Mark a new seam line on the back parts of the legs, decreasing ease the amount measured in the tuck. Because the fullness is only in the back, do not adjust the front of the pants.

_____ 2. Release the seams in the crotch area 2 inches on the center front and back seams and down to the knees on the inseams.

_____ 3. Measure the amount of excess fabric in the tuck pinned by the fitter. Write this measurement on the alteration tag.

_____ 4. Stitch the seams together. Trim the seam allowance as needed. Press the seam open.

_____ 5. Pin the front and back pants together, matching the new seam line on the back to the original seam line on the front.

Activity 20-7 • Research

Directions

Complete the following activity to review the alteration procedures for altering jackets. Next to each type of jacket alteration place the letter(s) of the procedure(s) that are used for that alteration. Place the letters of the procedures in the order in which the procedures should be performed. Many procedures will be used for more than one type of jacket alteration.

Procedures

A. trim and press the new seam open
B. release the collar seam and shoulder seams from the neck to about 1 inch from the armseye seam
C. move the buttons 1/4 inch towards the center front
D. let out the center back seam
E. remove all or part of the collar from the jacket
F. use chalk to mark the fabric
G. construct a new collar to fit the larger neckline
H. release the side seams from the hem to the armseye seam
I. take up the side seams from the hem to the armseye seam

Type of Alteration

________________ 1. Decreasing back neck fullness

________________ 2. Decreasing shoulder width in the back

________________ 3. Increasing shoulder width in the back

________________ 4. Increasing fullness in the abdomen area

________________ 5. Decreasing fullness in the abdomen area

Activity 20-8 • Multiple Choice

Directions

Complete the following activity to demonstrate your knowledge of the process of lengthening and shortening garments. In the blank to the left of each item, place the letter of the response that best completes the statement.

_____ 1. The best type of mirror for clients to stand in front of when altering the hems of their garments is a
A. darkened mirror
B. four-way mirror
C. one-way mirror
D. three-way mirror

_____ 2. The best hem finish to use when lengthening or shortening the hem of a ready-made garment is
A. a unique finish not used anywhere else on the garment
B. nothing, no finish is necessary
C. seam tape
D. the same finish originally used

_____ 3. While having the hem of a garment measured, the client should wear
A. a leotard
B. tennis shoes and socks
C. the undergarments and shoes to be worn with the garment being altered
D. undergarments and socks

_____ 4. After the original hem is released, a garment should hang on a hanger for
A. 20 minutes
B. 12 hours
C. 24 hours
D. 72 hours

_____ 5. After altering, the lining of a jacket or coat can be reattached with
A. French tacks
B. fusible interfacing
C. safety pins
D. seam tape

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Activity 20-8 • Multiple Choice, cont'd.

_____ 6. The type of hem that is appropriate for showing on the outside of the garment is the
A. blind stitch
B. glued-hem stitch
C. serged hem stitch
D. top stitch

_____ 7. The amount a garment can be lengthened depends on the
A. circumference of the original hem
B. depth of the original hem
C. number of pleats
D. type of fabric

_____ 8. When shortening the hemline of a lined garment, the new hemline should be marked with
A. basting stitches
B. chalk
C. dressmaker's carbon paper
D. straight pins

_____ 9. Skirts or dresses that are pleated can be shortened from the
A. hemline only
B. waistline and any vertical seams below the waist
C. waistline only
D. waistline or the hemline

_____ 10. A lining that is sewn securely in to a garment's edges is called a(n)
A. attached lining
B. free-hanging lining
C. sewn lining
D. tacked lining

Activity 20-9 • True/False and Short Answer

Directions

Part 1

To review general procedures for altering children's clothes, complete the following activity. If the statement is **True**, circle the letter **T** to the left of the statement. If the statement is **False**, circle the letter **F**. If the statement is **False**, rewrite the statement to make it **True**.

T F 1. Children's clothing is usually easier to alter than adults' clothing.

____

T F 2. Children's clothing should fit snugly.

____

T F 3. Children's alterations are usually made to improve the fit of the garment.

____

T F 4. Most children can wear the same garments for many years.

____

T F 5. Parents should buy children's clothing that can be altered so the children can wear the clothing longer.

____

Part 2

List five design features that allow children's clothing to be altered and worn longer.

6. ______________________________
7. ______________________________
8. ______________________________
9. ______________________________
10. ______________________________

Chapter 21

Laundry and Dry Cleaning Procedures

Chapter Focus

The following Essential Knowledge and Skills are discussed in Chapter 21:

7A Define terms commonly used in commercial textile and apparel care.
7D Identify equipment and supplies and their uses in textile and apparel care.
7E Demonstrate proper selection, use, and care of equipment and products for cleaning, laundry, and pressing tasks.
7F Perform commercial care procedures for textile and apparel products in accordance with content and care label information.
7H Complete commercial textile and apparel care tasks according to industry standards

Introduction

The goal of laundry and dry cleaning employees is to remove soil and provide customers with clean textile and apparel products. Appropriate products and procedures must be used to ensure good cleaning results and to protect textile and apparel items from damage.

Chapter 21 summarizes laundry and dry cleaning products, as well as procedures such as sorting and stain removal. Also covered are functions of mechanical, chemical, and thermal energy in the laundering process and the operation of commercial washers, dryers, and dry cleaning equipment.

Activity 21-1 • Sentence Completion

Directions

The statements below review a variety of laundry products. Complete each item by writing in the letter of the product that best completes the statement. Products may be used more than once.

A. Bluing
B. Builders
C. Chlorine bleaches
D. Detergents
E. Fabric softeners
F. Fluorescent whitening agents
G. Oxygen-based bleaches

H. Phosphates
I. Presoak products
J. Soaps
K. Starches
L. Suds control agents
M. Surfactants
N. Water softening agents

1. _______ may be added to the final rinse cycle or applied to garments before or during pressing.

2. To help prevent soap curd deposits when soaps are used in hard water, add _______ to both wash and rinse waters.

3. _______ contain enzymes or oxygen bleaches that work on soils in the period before the laundering process.

4. The wetting ability of water is improved by using _______.

5. Mild cleaning products made by combining a strong alkali with animal fat are called _______.

6. The amount of bubbles produced during the washing process may be controlled through using _______ in laundry detergents.

7. All granular laundry detergents contain substances that increase the efficiency of cleaning agents; these _______ tie up or inactivate minerals in hard water.

8. _______ are used as builders because they have the ability to sequester water hardness minerals and hold them tightly in solution to prevent redepositing on fabrics.

9. Basic ingredients such as surfactants, dyes, bleaches, and softeners may be found in laundry _______.

10. Because it is believed that they contribute to the eutrophication of streams and rivers, use of _______ is prohibited in some areas.

11. Products that may be used on washable, colorfast cotton and permanent-press fabrics to whiten, remove stains, deodorize, and disinfect are _______.

12. Products used to provide bleaching action for stain and soil removal on all colored, washable fabrics are called _______.

13. If a fabric has a chlorine retentive finish, _______ should not be used because they may cause the fabrics to turn yellow.

14. _______ is a liquid or powder added to laundry solutions to prevent white fabrics from yellowing and to add a desirable blue-white color to white

15. _______ absorbs unseen ultraviolet rays from the sun and convert this energy to visible light to maintain whiteness or brightness in fabrics.

16. Products available in liquid form, saturated paper or fabric sheets, and packets are _______.

17. To avoid staining or discoloring textile and apparel products, both fabric softeners and _______ should be diluted before adding to wash or rinse water.

18. Products that give laundry a soft feeling, make pressing easier, prevent static electricity, and add a pleasing fragrance to laundered articles are _______.

19. Products that give body to fabrics made of natural fibers, increase resistance to soiling, and make pressing easier are _______.

20. To prevent the formation of soap curd in hard water, it is best to use _______ instead of soaps.

Activity 21-2 • Writing

Directions

Review prelaundry procedures by completing the following activity. Each statement describes a prelaundry guideline that should be followed. After each statement, explain ***why*** the procedure is recommended. Use complete sentences when responding. An example is provided.

Example: Textile and apparel products should be sorted into a minimum number of categories. Too many categories will result in small loads and underfilled washing machines.

1. Items of similar size should be sorted for laundering together.

2. Heavily soiled items should be laundered separately from moderately or lightly soiled items.

3. Dark and light colored items should be sorted for separate laundering.

4. As they sort laundry, employees should check pockets, close zippers, fasten closures (such as buttons and snaps), and remove ornamentation.

5. Laundry should be sorted on a table or counter.

6. Hot water should not be used when soaking textile and apparel items to remove stains.

7. When preparing to remove a stain, it is important first to determine the cause of the stain.

8. One should always test a stain remover on an inconspicuous area of the fabric before using it to treat a stain.

9. When pretreating, stain remover should be applied to the back of a stain rather than the front.

10. When removing a stain, begin working slightly outside the stain and work in a circular motion toward the center of the stain.

Activity 21-3 • Matching

Directions

Complete the following activity to differentiate between the functions of mechanical energy, chemical energy, and thermal energy. For each item listed below, select the ***best*** answer from the energy choices provided. Place the letter representing the selected form of energy in the blank to the left of the statement.

C = Chemical Energy
M = Mechanical Energy
T = Thermal Energy

_____ 1. This is provided by the washing action of the washing machine.

_____ 2. This is supplied by warm water or hot water.

_____ 3. This can be increased through pretreating, soaking, and adding more laundry product.

_____ 4. This can be increased through the use of surfactants and emulsifiers.

_____ 5. Excessive amounts can result in construction damage to textile and apparel products.

_____ 6. This is supplied by bleach, detergents, and other laundry products.

_____ 7. This can be supplemented in warm or cold water temperatures by using additional detergents and bleaches.

_____ 8. The agitation, speed, load size, water level, and operation time influence the effectiveness of this.

_____ 9. Sequestering certain water minerals that would otherwise interfere with effective laundering is an example of this.

_____ 10. Energy can be conserved by rinsing in the coolest water temperature that still produces desired results.

Directions

The following statements relate to use of various water temperatures during the laundering process. In each blank, place the letter of the response indicating the most appropriate water temperature.

H – Hot *W – Warm* *C – Cold*

1. The water temperature that conserves the most energy when used in the wash cycle is ______.

2. Water that is 100°F is ______.

3. The water temperature that cleans and sanitizes most effectively is ______.

4. The water temperature that may be used for rinsing laundry washed in any temperature is______.

5. Water that is 60°F is ______.

6. To wash colored fabrics, lightly soiled fabrics, permanent-press fabrics, and noncolorfast fabrics, a mild detergent and ______ water should be used.

7. Water that ranges in temperature from 130° to 160°F (54° to 71° C) is ______.

8. For effective cleaning, oily and greasy soils require ______ water.

9. A liquid detergent or a predissolved powder detergent should be used when laundering in ______ water.

10. The water temperature that is recommended for washing heavily soiled permanent-press, white, and light colorfast fabrics is ______.

Activity 21-5 • Short Answer

Directions

To review the operation of commercial washers and dryers, respond to the following items. Record your answers in the space provided.

1. What are the main differences between commercial laundry equipment and home laundry equipment?

2. How many pounds of laundry does a home washing machine typically hold?

3. What are *baffles*?

4. What is the most effective method used to measure the amount of water filling the washer tubs?

5. What is *extraction*?

6. What are three factors to consider when choosing a wash cycle?

7. How are computer programs utilized in commercial washers?

8. What is the main disadvantage of commercial dryers?

9. What is the function of a dryer thermostat?

10. Why should the lint filter be cleaned after each use of the dryer?

Activity 21-6 • Writing

Directions

In the spaces provided, respond to each of the following items about precleaning procedures. Write brief paragraphs using complete sentences.

1. Explain the importance of testing textile and apparel products for colorfastness and durability before dry-cleaning the products.

2. Describe how dry cleaners test durability and colorfastness of textile and apparel products.

3. Explain when and how to use the two types of stain removal chemicals used in pretreating stains before dry-cleaning textile and apparel products.

Activity 21-7 • Writing

Directions

Write a brief report describing the operation of commercial dry cleaning equipment. Be sure to include the various parts of the equipment and the functions of each.

The Operation of Commercial Dry Cleaning Equipment

Chapter 22

Receiving, Marking, and Identifying Laundry and Dry CLeaning

Chapter Focus

The following Essential Knowledge and Skills are discussed in Chapter 22:

7A Define terms commonly used in commercial textile and apparel care.

7G Determine procedures for efficiently marking and tracking items in a commercial textile and apparel care operation.

Introduction

Employees of laundries and dry cleaners are responsible for caring for customers' textile and apparel products. Employees must follow certain procedures for receiving, marking, and identifying laundry in order to reduce risk of damaging or misplacing items. Chapter 22 explains common procedures followed in laundry and dry cleaning establishments and overviews the variety of services available.

Activity 22-1 • Writing

Directions

Review vocabulary words relating to receiving, marking, and identifying laundry and dry cleaning by completing the following activity. In the space provided, write a short story using the vocabulary word list. Use your creativity and have FUN!

Vocabulary Words

Commercial laundry
Dry cleaning plant
Finish
Indelible ink
Laundry drop-off center
Soiling materials
Ornamentation
Pressing
Pretreating
Self-service dry cleaning machine
Sizing

Title: ____

Activity 22-2 • Short Answer

Directions

Review general procedures for receiving, marking, and identifying laundry by responding to the following items. Record your answers in the spaces provided.

1. Explain the difference between the two pricing systems used by commercial laundries.

2. State two methods laundries may use to identify owners of textile and apparel products.

3. Describe three special services that commercial laundries may offer, usually for an extra fee.

4. List four characteristics of textile and apparel products that should be considered when sorting in order to avoid damage during laundering.

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Activity 22-3 • True/False

Directions

Review general procedures for receiving, marking, and identifying dry cleaning by completing the following activity. Read each statement. If the statement is **True**, circle the letter **T** to the left of the statement. If the statement is **False**, circle the letter **F**. If the statement is **False**, rewrite the statement to make it **True**.

T F 1. Customers should be asked if they would like any additional finishing services such as replacement of sizing and other fabric finishes on textile and apparel products.

T F 2. Textile and apparel products to be dry cleaned should be sorted according to type of fabric, color of fabric, and degree of soiling.

T F 3. When customers drop off textile and apparel products to be dry cleaned, procedures followed by employees receiving the items are totally different from those followed by laundry employees.

T F 4. It is not necessary for dry cleaning personnel to have information on soiling materials that have stained textile and apparel products left for cleaning.

T F 5. Dry cleaners will automatically replace sizing and other fabric finishes on textile and apparel products left by customers.

T F 6. When clothing is left for dry cleaning, items found in the pockets are put in a box labeled *Lost and Found*; customers may look through the box for any missing items when they pick up their products.

Activity 22-3 • True/False, cont'd.

T F 7. Dry cleaners often provide optional services such as mending and repair that may require an additional charge.

T F 8. Ornamentation should be removed from textile and apparel products to avoid damage or loss.

T F 9. Employees of a business that offers both commercial laundry and dry cleaning services must pay special attention when customers explain the type of cleaning services desired.

T F 10. Self-service dry cleaning machines resemble coin-operated washing machines but require the use of liquid laundry detergent.

Chapter 23

Safety and Sanitation for Laundering, Pressing, and Dry Cleaning

Chapter Focus

The following Essential Knowledge and Skills are discussed in Chapter 23:

7A Define terms commonly used in commercial textile and apparel care.

7B Explain how regulations pertaining to workplace safety, labor, and environmental issues affect the commercial textile and apparel care operation.

7C Apply effective safety and sanitation practices in textile and apparel care operations.

7D Identify equipment and supplies and their uses in textile and apparel care.

7E Demonstrate proper selection, use, and care of equipment and products for cleaning, laundry, and pressing tasks.

7H Complete commercial textile and apparel care tasks according to industry standards.

Introduction

Many times, employees ignore preventive measures and safety programs. As a result, accidents occur. Most accidents are caused by carelessness and are avoidable. Accidents happen when individuals are irresponsible or do not care about their work. Laundry and dry cleaning employees are responsible not only for their own safety but also for the safety of others in the workplace. Benefits of reducing accidents include lower insurance premiums, maximized productivity, and a lower absentee rate resulting in higher morale among co-workers.

Activity 23-1 • True/False

Directions

Complete the following activity to review appropriate safety procedures to observe when laundering, pressing, or dry cleaning textile and apparel products. Read each statement. If the statement is **True**, circle the letter **T** to the left of the statement. If the statement is **False**, circle the letter **F**. If the statement is **False**, rewrite the statement to make it **True**.

T F 1. The interlocking device on a commercial washer prevents the washer lid from being opened while the tub is in motion.

____

T F 2. Safety features are special parts included on a piece of equipment to protect the equipment from being damaged.

____

T F 3. The main reason employees should learn about the safety features of commercial washing machines is to impress the supervisor.

____

T F 4. The push-to-stop timer allows the operator to stop a cycle in progress.

____

T F 5. The safety door switch and separate start button both prevent the dryer from tumbling when the door is open.

____

T F 6. The friction door latch prevents small children from being trapped inside by allowing the dryer door to open from the inside.

____

T F. 7. Safety features on equipment guarantee that accidents will not occur.

____

Activity 23-1 • True/False, cont'd.

T F. 8. If dry cleaning solvent is spilled on clothing being worn, the clothing should be removed immediately and aired out until the solvent has completely evaporated.

____

T F. 9. It is important that ventilation in the work area be adequately maintained.

____

T F. 10. If dry cleaning solvent is spilled on clothing, the garment should be put into a washing machine immediately.

____

T F. 11. Garments damp with dry cleaning solvent may be dried in a commercial dryer.

____

T F. 12. Nonflammable solvents will ignite when they come into contact with sparks or flames, even a spark from a fan.

____

T F. 13. Poisonous vapors can be formed from the breakdown of nonflammable solvents.

____

T F. 14. Steam equipment is safer than a hot iron because it does not burn skin.

____

T F. 15. An employee should consult with a co-worker before deciding to move commercial pressing equipment to another location.

____

Activity 23-1 • True/False, cont'd.

T F. 16. When an iron is not in use, it should be turned off and laid flat on a heat-resistant surface.

____

T F. 17. Employees should empty water remaining in a steam iron after use.

____

T F. 18. Controls on irons are designed to provide only the amount of heat an iron needs.

____

T F. 19. The heel of an iron acts as a rest and holds the iron in a well-balanced, upright position.

____

T F. 20. The upper surface of a well-designed iron gets much hotter than the lower, pressing surfaces.

____

Activity 23-2 • Short Answer

Directions

To review effective sanitation methods when laundering, dry cleaning, and pressing textile and apparel products, respond to the following items. Record your answers in the spaces provided.

1. Explain why sanitation should be practiced in laundry and dry cleaning establishments.

2. Explain why employees should practice good personal hygiene.

3. Wash water temperature should be at least 130°F. Explain why.

4. Explain the use of ultraviolet lamps in some commercial dryers.

5. Explain why commercial washing machines must be sanitized on a regular basis.

Activity 23-2 • Short Answer, cont'd.

6. Describe the sanitation method used for commercial washers.

7. Define the term *stagnant solvent*.

8. Explain why textile and apparel products should never be exposed to stagnant solvent.

9. Explain the importance of properly sanitizing textile and apparel items during the laundering or dry cleaning process and before the pressing process.

10. Explain the importance of keeping pressing equipment clean.

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